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AND

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POTTER.

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A COMPEND
OF
MATERIA MEDICA,
THERAPEUTICS,
AND PRESCRIPTION WRITING;

WITH ESPECIAL REFERENCE TO THE PHYSIOLOGICAL
ACTIONS OF DRUGS.

BASED ON THE LAST REVISION OF
The U. S. Pharmacopoeia,
INCLUDING ALSO MANY UNOFFICIAL REMEDIES,

BY

SAM'L O. L. POTTER, M.A., M.D.,

PROFESSOR OF THE PRACTICE OF MEDICINE IN COOPER MEDICAL COLLEGE, SAN FRANCISCO; LATE A. A. SURGEON, U. S. ARMY; AUTHOR OF "COMPEND OF HUMAN ANATOMY," "AN INDEX OF COMPARATIVE THERAPEUTICS," AND OF THE LEA PRIZE ESSAY OF JEFFERSON MEDICAL COLLEGE, ON "DYSALIA, A STUDY OF SPEECH AND ITS DEFECTS."

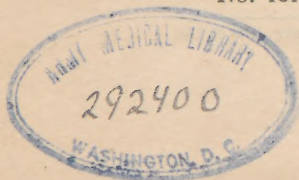
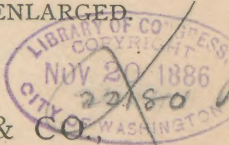
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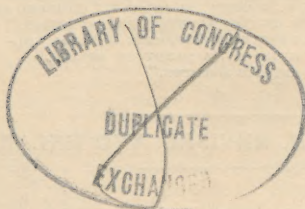
HENRY G. PIFFARD, A.M., M.D.,

OF NEW YORK CITY,

THIS COMPEND IS DEDICATED, IN ACKNOWLEDGMENT OF

HIS FEARLESS TEACHINGS

IN THERAPEUTICS.



PREFACE TO FIRST EDITION.

This Compend is based on the Sixth Revision of the U. S. Pharmacopoeia (1880), on the regular text books of Materia Medica and Therapeutics, particularly those by Bartholow, Wood, Ringer, Stillé, Phillips, Piffard, Biddle, Trousseau, and Waring; and on the Author's own notes of two courses of didactic and clinical lectures by Professors Bartholow and Da Costa.

Intended as a book for medical students, brevity of statement is one of its principal features. At the same time, the essentials of the subject have been kept in view; from a desire to make the book not only the best of its kind, but a compact compendium of the established maxims of therapeutical science, and the most advanced views concerning the physiological actions of drugs. The preparations noted under each title are those in most general use; to have described all would have been to unnecessarily burden the student's memory.

PREFACE TO FOURTH EDITION.

The text has again undergone a careful revision for this edition, Dr. Brunton's new Treatise on Pharmacology, Therapeutics, and Materia Medica, having been carefully read before revising. Several articles have been entirely re-written, a chapter on Prescription Writing has been added, and the New Remedies are considered as fully as the limits of the work will allow, in a series of brief notices appended to the text.

S. O. L. P.

COOPER MEDICAL COLLEGE,
San Francisco, Sept. 1886.

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EXPLANATION.

*Drugs and Preparations marked thus * are not official in the U. S. Pharmacopæia of 1880.*

The Doses given are for adults; for children the following rule (Young's) will be found the most convenient. Add 12 to the age, and divide by the age, to get the denominator of the fraction, the numerator of which is 1. Thus, for a child two years old, $\frac{2+12}{2} = 7$ and the dose is one-seventh of that for an adult. Of powerful narcotics scarcely more than one-half of this proportion should be used. Of mild cathartics, two or even three times the proportion given may be employed.

For Hypodermic Injection, the dose should be three-fourths of that used by the mouth; by rectum five-fourths of the same.

Pronunciation.—Attention is particularly directed to the accentuation of words commonly mispronounced; as, for example, acētās, ātropā, chimāphila (*kima*), chlōridum, codēia, conium, ēnema, iōdidum, radicis, rīcinus, sināpis, syrūpus, ēczema, umbillicus, abdōmen, brōmidum.

The Sign (?) after a preparation signifies that it is of doubtful utility; after a statement of physiological action, that the question is disputed and as yet unsettled.

WEIGHTS AND MEASURES.

APOTHECARIES' OR TROY WEIGHT.				
Pound.	Ounces.	Drachms.	Scruples.	Grains.
℔.	℥.	ʒ.	ʒ.	gr.
1	= 12	= 96	= 288	= 5760
		1	= 8	= 24
			1	= 3
				1 = 20

METRIC WEIGHTS.	
1 Milligram.....	0.001 = gr. $\frac{1}{256}$
1 Centigram.....	0.01 = gr. $\frac{1}{25}$
1 Decigram.....	0.1 = gr. $1\frac{1}{2}$
1 Gram.....	1. = gr. 15.432
1 Kilogram.....	1000. = ℔. 2.7

APOTHECARIES' OR WINE MEASURE.				
Gallon.	Pints.	Fl'ounces.	Fl'dr'ms.	Minims.
C.	O.	℥.	ʒ.	℥.
1	= 8	= 128	= 1024	= 61440
		1	= 16	= 128
			1	= 8
				1 = 60

APPROXIMATE EQUIVALENTS.	
1 ℥ or 1 gr.....	= .06 grams.
1 f℥ or 1 ʒ.....	= 4. "
1 f℥.....	= 30. "
1 ʒ.....	= 31. "
1 f℥ Glycerin.....	= 37. "
1 f℥ Syrup.....	= 40. "

A COMPEND
OF
MATERIA MEDICA
AND
THERAPEUTICS.

INTRODUCTION.

Materia Medica is that branch of medical science which treats of the substances used as medicines, their origin, composition, modes of preparation and administration, physiological and toxicological actions.

Therapeutics. Derived from the Greek *θεραπεύω*, *therapeuein*, to attend upon—it is the science of the application of medicines to the alleviation or cure of disease.

Pharmacy and Pharmacology. *Pharmacy* is the art of preparing medicines for use; *Pharmacology* is a general term signifying a knowledge of medicinal agents in its widest sense, and includes Pharmacy, Materia Medica and Therapeutics. The latter term is, by some writers, restricted to the science of the action of drugs upon a healthy organism.

The Pharmacopœia is the official list of those drugs and their preparations, which are recognized by the medical profession in a certain country; as the PHARMACOPŒIA OF THE UNITED STATES (U. S. P.), the British Pharmacopœia (B. P.), etc. In foreign countries this list has the force of law, being published under governmental auspices; but in the United States it is revised every ten years by a convention representing the medical and pharmaceutical professions. The sixth decennial revision was published in October, 1882.

A Dispensatory is an encyclopædic treatise on medicines, which includes their physical and medical history, their composition and uses. It is a private publication, of authority according to the reputation of its author, and treats of drugs which, though not official in the Pharmacopœia of one

country, may be in that of another; as well as many drugs which are not official anywhere.

Preparations Recognized by the U. S. Pharmacopœia, number thirty-four, and are as follows, viz.:—

Decoctum.—A Decoction is made from a vegetable drug, by boiling in water for a varying length of time.

Infusum.—An Infusion is made from a vegetable drug, by displacement or maceration in cold or hot water, without boiling.

Aqua.—A Water is a solution in water of a volatile substance.

Liquor.—A Liquor or Solution is made by dissolving a non-volatile substance in water.

Spiritus.—A Spirit is an alcoholic solution of volatile principles, made from the pure drug by distillation or direct solution.

Tinctura.—A Tincture is an alcoholic solution of non-volatile principles, prepared from the pure drug by maceration or displacement, or by dissolving the principles themselves. *Tinctura Herbarum Recentium*, Tinctures of Fresh Herbs, are prepared from the fresh herbs, bruised or crushed, by maceration with alcohol for fourteen days.

Elixir.—An Elixir is a dilute tincture made agreeable to the taste by the addition of sugar and some aromatic.

Extractum Fluidum.—A Fluid Extract is a concentrated preparation, so made that each minim represents about one grain of the crude drug. To this rule there is but one exception, the Compound Fluid Extract of Sarsaparilla. They all contain alcohol, and many glycerin also, as a preservative. The Fluid Extract of Ergot contains dilute hydrochloric acid.

Extractum.—An Extract is a solid or semi-solid preparation, made by evaporating either the fresh juice or an alcoholic or watery solution of the drug.

Abstractum.—An Abstract is a dry, powdered extract, which is about twice the strength of the corresponding fluid extract.

Massa.—A Pill-mass is a preparation of proper consistence for making pills.

Pilula.—A Pill is a small spherical body containing medicinal agents, with some excipient, as gum, mucilage, soap, etc., to give it body.

Mistura.—A Mixture contains one or more insoluble substances held in suspension in water by the aid of a suitable vehicle. [*An Emulsion* is a mixture having an oil suspended in water by means of a gum or an albuminous substance.]

Mucilago.—A Mucilage is a solution of a gum in water.

Syrîpus.—A Syrup is a saturated solution of sugar in water. It may be simple, or compound; in the latter case being combined with other agents.

Mel.—A Honey is a preparation having honey as its base.

Vinum.—A Wine is a preparation having white wine as its menstruum.

Acetum.—A Vinegar has dilute acetic acid as its menstruum.

Glyceritum.—A Glycerite has glycerin as its menstruum.

Oleum.—An Oil is an oily principle obtained by expression (fixed oils), or by distillation (volatile, essential oils).

Oleatum.—An Oleate is a compound of oleic acid with a salifiable base.

Oleoresina.—An Oleoresin is an ethereal extract of a crude drug, and generally contains an oil and a resin.

Resina.—A Resin is a principle obtained from a saturated tincture by precipitation with water.

Confectio.—A Confection is composed of medicinal substances beaten up with sugar or honey, or both, into a pasty mass.

Trochiscus.—A Troche or Lozenge is a medicated gummy disk, meant to dissolve slowly in the mouth.

Unguentum.—An Ointment is a mixture of medicinal substances with a fatty material, or with lard, for external use only.

Ceratum.—A Cerate is an ointment having wax (*Cera*) as its base.

Suppositoria.—Suppositories are conical medicated bodies having cacao butter (*Oleum Theobromæ*) as their base; and are intended for introduction into the rectum, uterus, or vagina, where they melt at the temperature of the body.

Emplastrum.—A Plaster is made by spreading solid substances on muslin or other material, by the aid of heat, and is adhesive at the temperature of the body.

Charta.—A Paper is a sheet of paper medicated for external use.

Collodium.—A Collodion is a solution of gun-cotton (*Pyroxylin*) in ether and alcohol.

Linimentum.—A Liniment is a liquid preparation, usually containing soap or oil, and intended for external application by rubbing.

Pulvis.—A Powder is a drug in a state of minute subdivision, prepared by pulverization.

Trituratio.—A Trituration is a more minutely comminuted powder prepared by trituration of the substance (10 parts) with sugar of milk (90 parts).

Unofficial Preparations, are as follows:—

Enema.—An Enema or Clyster is a liquid for rectal injection.

Bólus.—A Bolus is a large-sized pill.

Discus.—A Disk is a medicated scale of gelatin, for local use to the eye.

Gránulum, Parvulum.—A Granule or a Parvule is a very small pill, composed of active principles or powerful drugs.

Dragée.—A Dragee is a sugar-coated pill.

Bougium.—A Bougie is a small suppository for insertion into the urethra.

Pessarium.—A Pessary is a vaginal suppository.

Gly'cecol.—A Glycecol is a jelly troche, the base of which is a mixture of gelatin or isinglass with glycerin, called glycecolloid.

Medicines may be introduced into the Circulation—by the stomach, the respiratory tract, the rectum, the veins, the subcutaneous cellular tissue, and the integument. The stomach is the route most frequently used, and when it is empty, and its mucous membrane healthy, crystalloidal substances in solution pass through the walls of its vessels with the greatest rapidity. Colloidal substances (fats, albumen, gum, gelatin, etc.) require to be digested and emulsified before they are absorbed.

Medicines are applied to the Broncho-pulmonary mucous membrane—by the insufflation of powders into the nares, fauces, larynx, etc., by the nasal douche, and by inhalation of vapors or atomized fluids.

Medicines best absorbed by the Rectum. are the salts of the alkaloïds in solution, especially those of morphine, atropine, and strychnine, the latter more quickly than by the stomach. Also acid solutions of medicines, if not too frequently repeated.

The Hypodermic Method is the introduction of medicines into the organism by injection into the subcutaneous areolar tissue. The medicine must be in a state of solution, and is thrown in by a hypodermic syringe. The usual menstruum is distilled water, and the solution should be of neutral reaction, and freshly made. Care must be taken to avoid puncturing a vein. The most suitable localities are the arms, abdomen, thighs, back, and the calves of the legs.

Medicinal Agents which may be introduced into the Veins. Only in emergencies is any such procedure admissible, as the operation is highly dangerous. *Saline Solutions* in the collapse of cholera, diabetic coma, etc.; a solution of *Ammonia* for the bites of venomous snakes, chloroform asphyxia, opium narcosis, hydrocyanic-acid poisoning, etc.; and *Transfusion* of blood or milk, as a last resort in hemorrhage, epilepsy, uræmia, the collapse of cholera, etc., are the instances which are admitted in practice.

Arterial Transfusion has also been performed successfully in a number of cases, and is considered safer than venous transfusion when a large quantity has to be introduced into the circulation.

CLASSIFICATION OF MEDICINES.

Tonics—are substances which, taken internally, restore lost tone to the organs or tissues upon which they act; such as—Strychnine, on the spinal cord,—Digitalis, on the heart,—Iron, on the blood,—Bitters, on the stomach.

Astringents—are drugs which cause contraction of muscular tissue, by direct irritation probably. Such are Tannic and Gallic Acids, Alum, and Lead, Copper, Bismuth, and Silver salts, etc.

Alteratives—are remedies which appear to alter certain morbid processes, perhaps by modifying nutrition, but precisely how they act is unknown. Certain positive therapeutists have recently denounced the term *Alterative* as a mere "*cloak for ignorance*;" but have not presented a better designation for a class of remedies whose operations are among the most thoroughly established of clinical facts. Such are Arsenic, Mercury, Iodine, Cod-liver Oil, Sarsaparilla, etc.

Antispasmodics—are drugs which act upon the nerve centres, increasing their tone, without producing any very serious symptoms. Such are Camphor, Assafoetida, Musk, Valerian, Coffee, Cimicifuga, etc.

Analgesics or Anodynes—are remedies whose chief use is to relieve pain, either by direct action on the conscious cerebral centres, or by impairing the conductivity of the sensory nerve fibres. Such are Opium, Hemp, etc.

Hypnotics—are remedies which produce sleep without causing previous cerebral excitement. Such are Chloral Hydrate, Potassium Bromide.

Narcotics—are agents which, at first excitant to the brain, produce profound sleep, and if the dose be sufficient, coma. They are now placed in various classes, according to their several actions on the cerebrum. Such are Opium, Hemp, Alcohol, and the Anæsthetics.

Anæsthetics—are volatile substances which, when inhaled, produce loss of consciousness and sensibility, with lessened motor power. They are Ether, Chloroform, Nitrous Oxide, Bichloride of Methylen, etc. The Narcotics also produce anæsthesia. *Local Anæsthetics*, when applied to a tissue, lower its sensibility by direct action on the sensory nerves. Such are Ether Spray, Carbolic Acid, Ice, Veratrine, Cocaine, etc.

Anaphrodisiacs—are agents which lower the sexual function,—as Camphor, Tobacco, Bromides, etc.

Aphrodisiacs—are agents which stimulate the sexual function,—as Phosphorus, Cantharis, Strychnine, etc.

Mydriatics—are remedies which, administered internally or locally, produce dilatation of the pupil. The chief mydriatics are Belladonna, Hyoscyamus, Stramonium and Duboisia.

Excito-motors—are agents which produce disturbances of motility by increasing the reflex function of the spinal cord. Such are—Nux Vomica, Ignatia, Picrotoxin, Ergot, etc.

Depresso-motors—are agents which lessen the activity of the spinal centres. The chief members of this class are Physostigma, Conium, Gelsemium, Aconite, Chloral, Tobacco, Lobelia, Bromides.

Cardiac Stimulants,—include Ammonia, Alcohol, Turpentine, Digitalis, Convallaria, Squill, etc.

Cardiac Sedatives,—include Aconite, Veratrum, Antimony, Hydrocyanic Acid, Vegetable Acids, Muscarine, Potassium salts, etc.

Emetics—are drugs which produce vomiting. *Local or Mechanical Emetics*, as Mustard, Alum, Squill, Sulphates of Zinc and Copper, act directly by irritating the end organs of the gastric nerves. *Systemic Emetics*, as Antimony, Ipecacuanha, Apomorphine, Veratrine, etc., act indirectly by excitation of the centre which presides over the emetic function.

Cathartics—are agents which increase or hasten the intestinal evacuations. They may be subdivided according to several classifications, one of which is as follows :—

Laxatives,—as Sulphur, Magnesia, Tamarinds, Figs, Prunes, etc.

Purgatives,—as Senna, Castor Oil, Rhubarb, Calomel, Aloes, etc.

Saline Purgatives,—Magnesium Citrate and Sulphate, etc.

Drastics,—Croton Oil, Jalap, Colocynth, Elaterium, etc.

Hydragogues,—Potass. Bitartrate, Elaterium, Gamboge, etc.

Cholagogues,—Podophyllin, Euonymin, Rhubarb, Aloes, etc.

Diuretics—are remedies which increase the flow of urine, either by stimulating the action of the kidneys, raising the blood pressure, or washing out the kidneys. The chief diuretics are—Juniper, Potassium salts, Cantharis, Digitalis, Squill, Scoparius, Spirit of Nitrous Ether, Turpentine, Copaiba, Cubebs, Pareira, Uva ursi, Buchu, Water, etc. They are usually divided into *Refrigerant* and *Stimulant Diuretics*, as enumerated on page

Diaphoretics or Sudorifics—are agents which increase the action of the skin. They are subdivided into—

Nauseating Diaphoretics, which act by producing relaxation,—as Tartar Emetic, Ipecacuanha, and Dover's powder.

Refrigerant Diaphoretics, which act by reducing the force of the circulation,—as Potassium salts, Aconite, Veratrum.

Simple Diaphoretics, which enter the circulation and stimulate the sudoriferous glands during their elimination,—as Jaborandi, Spirit of Mindererus (Liq. Ammonii Acetatis), Sweet Spirit of Nitre (Spiritus Etheris Nitrosi), Alcohol.

Expectorants—are remedies which modify the secretion of the broncho-pulmonary mucous membranes, and promote its expulsion. They are subdivided into—

Nauseating Expectorants,—as Tartar Emetic, Lobelia and Ipecacuanha.

Stimulant Expectorants,—as Ammonium Chloride, Ammoniac, Senega, Onion, Garlic, Squill, Tar, Benzoin, Balsam of Tolu.

Emmenagogues—are agents which promote the menstrual function. They may be subdivided into—

Indirect Emmenagogues,—as Iron, Strychnine, Aloetic purgatives, Mangnese, Cod-liver Oil, Cinnamon, etc.

Direct Emmenagogues,—as Sabina, Ruta, Petroselinum, Cantharis, Guaiac, Myrrh, Ergot, Quinine, Borax, Pulsatilla, etc.

Oxytocics or Ecbolics—are agents which stimulate contraction of the uterine muscular fibre,—as Ergot, Ustilago, Gossypium.

Sialogogues—are medicines which increase the secretion of the salivary glands and the buccal mucus. They act either by local irritation, producing reflex activity,—as Pyrethrum, Cubebs, Mezereon, Capsicum; or by stimulating the glands during elimination,—as Mercury, Potassium Iodide, etc.

Errhines—are agents which increase the secretion of the nasal mucous membrane, without causing sneezing, as a rule. Such are the vapor of Ammonia, Cubebs, etc.

Sternutatories—are substances which irritate the nasal mucous membrane, and cause sneezing,—as Tobacco, Ipecacuanha, Ginger, Sanguinaria, etc.

Counter-irritants—are substances which, when applied locally, produce a greater or lesser degree of cutaneous irritation. They may be subdivided into—

Rubefacients, which cause redness (congestion) of the skin,—as Mustard, Capsicum, Turpentine, Ammonia, Pitch, etc. The stronger agents of this subdivision are capable of destroying the tissue if left in contact with it for too long a time.

Epispastics, Vesicants, or Blisters, produce a decided inflammation of the skin, and the outpouring of serum. Cantharides is the agent most used for this purpose, but Mezereon, Euphorbium, etc., are equally efficient.

Escharotics—are substances which destroy the life of the tissue to which they are applied, either by abstracting its water,—as Sulphuric Acid; or by corrosive oxidation,—as Bromine. The chief caustics are Potassa, Lime, Arsenious Acid, Zinc Chloride, Silver Nitrate, Corrosive Sublimate, Mercuric Nitrate, Mineral Acids, Bromine, Sulphates of Zinc and Copper. Chromic Acid is one of the most efficient, but must be carefully used, it being a violent poison.

Demulcents—are bland substances of oleaginous or mucilaginous qualities, used to protect and soothe inflamed surfaces. In this class are Tragacanth, Gum Arabic (Acacia), Iceland Moss (Cetraria), Flaxseed (Linum), Barley (Hordeum), Liquorice (Glycyrrhiza), etc.

Emollients—are fatty or other substances which act as external demulcents, softening the skin, and protecting inflamed tissues. Such are Lard (Adeps), Cacao Butter (Ol. Theobromæ), Glycerin, Flaxseed Poultices, Starch, etc.

A Diluent—is an indifferent substance which, being absorbed, passes through the body, diluting its fluids and excretions. Water is the only true diluent.

Protectives. Collodion and Gutta-percha are those which are chiefly used. Plasters,—as the adhesive plaster, the lead plaster, or the soap plaster, also come in this class.

Anthelmintics—are medicines which kill (vermicides) or expel (vermifuges) intestinal worms. Such are the tæniafuges or expellers of the tapeworms,—as Male Fern (Filix Mas), Pumpkin seeds (Pepo), Koussou, Kamala, Turpentine, Pomegranate; those used against the round worms (Lumbrici),—as Santonin, Spigelia, Azedarach, Chenopodium; and those against the seat worms (Ascarides),—as Quassia or Salt, by enemata.

Antizymotics—are agents which arrest fermentative processes; and may be subdivided into two groups, viz. :—

Antiseptics,—which destroy the bacilli of septic decomposition, as Mercuric Chloride, Iodide and Oxide, Sulphurous and Carbolic Acids, etc.

Disinfectants,—which destroy the specific germs of communicable diseases. Some are oxidizants, as Fire, Lime, Chlorine, Iodine, Bromine, etc.; others are desulphurants, as Ferric Sulphate, Lime, etc.; and others are absorbents, as Charcoal, Dry Earth, etc. Many members of this group have the additional property of destroying foul smells, and are called *Deodorants*, such being Ozone, Earth, Lime, Charcoal, Chlorine and Sulphurous Acid Gases, etc.

Antiphlogistics and Antipyretics. *Antiphlogistics* are agents which can subdue inflammation,—as Mercury, Antimony, etc. *Antipyretics* reduce the body temperature in fevers,—as Digitalis, Quinine, Vegetable Acids, etc. Aconite and Veratrum belong to both groups.

Styptics or Hæmostatics—are agents which arrest hemorrhage. Such are Tannic and Gallic Acids, Alum, Zinc Chloride, Ferric Perchloride, etc.

Antagonists and Antidotes. *Antagonists* are agents acting on the body in direct opposition to each other,—as Strychnine and Chloral. *Antidotes* are remedies which remove or relieve the symptoms caused by poisons, and may be either chemical,—as Lime for Sulphuric Acid; or vital,—as Mercury for syphilis.

Acids and Alkalies. *Acids* in medicinal doses check acid secretions and increase alkaline secretions. *Alkalies*, in like manner, check alkaline and increase acid secretions. Thus a dilute acid given before meals will check the production of the acid gastric juice, but a dilute alkali will stimulate it. An alkali applied to the pancreatic duct will check the secretion of the alkaline pancreatic juice, but an acid will stimulate it.

Restoratives are remedies which promote constructive metamorphosis. Under this head are Aliments, Beverages, Digestion-ferments, Mineral Acids, Oils and Fats, Phosphorus, Iron, Bismuth, Arsenic, Bitters, Eucalyptus, Hydrastis, Cinchona, etc., most of which are termed *Tonics* in the older classifications.

Agents promoting Waste or Destructive Metamorphosis. The Alkalies, Vegetable Acids, Sulphides, the Metals, Iodine, and remedies containing Tannic and Gallic Acids, Colchicum, Sarsaparilla, Stillingia, etc., most of which are classified as *Alteratives* and *Astringents*.

DIGESTION-FERMENTS.

The Digestion-Ferments are Pepsin, Pancreatin, and Inguvin. *Pepsin* is an organic ferment obtained from the mucous membrane of the pig's stomach. **Pancreatin* is a similar substance obtained from the

pancreas of animals. **Ingluvin* is another, prepared from the gizzard of the domestic fowl.

Preparations. *Pepsinum Saccharatum*, Saccharated Pepsin, gr. v–lx. *Liquor Pepsini*, Solution of Pepsin, ℥ ss–℥ ij. Contains H Cl, Glycerin and Water.

**Liquor Pancreaticus*, ℥ ss–℥ iij. A pancreas digested in 5 per cent. of alcohol. **Emulsio Pancreaticus*, Pancreatic Emulsion, ℥ ss–℥ iij.

**Ingluvin*, gr. x–℥ j. **Peptonized Milk*, ad libitum.

Scheffer's Pepsin. The mucous membrane of a pig's stomach is digested in a solution of H Cl, and the Pepsin is then precipitated by adding a solution of Na Cl. Ten grains of Scheffer's Saccharated Pepsin, with gtt. x of dilute H Cl, and ℥ j of water, will dissolve 200 grains of albumen in from five to six hours, at 100° Fahr.

Incompatibles. Alkalies and many mineral salts precipitate pepsin. Alcohol destroys its activity. The action of pancreatin is, however, promoted by alkalies.

Physiological Actions. *Pepsin* and *Ingluvin* digest the nitrogenous principles of the food (albumen, casein, fibrin, etc.) converting them into peptones for assimilation; in which they are materially aided by Lactic and H Cl Acids. *Pancreatin* does the same, and in addition, with the aid of an alkali, it emulsifies fats and oils. Pepsin is an essential element of the gastric juice.

Therapeutics. *Pepsin* is indicated in atonic dyspepsia, the apepsia of infants, gastralgia, anæmia, chlorosis, gastric ulcer and cancer, diarrhoea of infants, and the vomiting of pregnancy. It is added to nutritive enemata, the rectum not being a digestive organ; and is injected into the substance of morbid growths which are homologous to the tissues, especially fatty tumors. *Ingluvin* is particularly useful against vomiting, and has been found very efficient in the vomiting of pregnancy. *Pancreatin* is used to assist the digestion of oils and fats, and should be administered 2 or 3 hours after meals; whilst Pepsin is best given near meal-time.

Peptonized Milk Gruel is one of the very best articles of food for the sick.

ACIDUM LACTICUM, —Lactic Acid.

Properties of Lactic Acid. It is a syrupy, oily liquid, of specific gravity 1.212, and difficult to obtain pure. It should be given in quantity sufficient to render water distinctly sour, and always well diluted. It is found in the stomach, being a product of the food, and combines with

bases in the blood, forming lactates, which being oxidized are converted into carbonates.

Physiological Actions. It aids digestion, and promotes the appetite; in large doses causing flatulence and much epigastric pain. Injected into the peritoneal cavity of animals, it excites endocarditis, and given in diabetes it has caused acute rheumatism and rheumatic endocarditis. Hence its supposed causation of acute rheumatism, when in excess and free in the blood.

Therapeutics. It is used in diabetes, atonic dyspepsia, oxaluria, and in the lithic and phosphatic diatheses when due to imperfect digestion and assimilation. As a solvent of false membrane in croup and diphtheria, it is unquestionably of great service.

MINERAL ACIDS.

Mineral Acids, their Preparations and Doses.

Acidum Sulphuricum Dilutum, strength $\frac{1}{10}$, gtt. iij-xv, well diluted.

Acidum Sulphuricum Aromaticum, Elixir of Vitriol, strength $\frac{1}{5}$, gtt. v-xx, well diluted. Contains sulphuric acid, alcohol, ginger and cinnamon.

Is not an acid, but an ether, from the reaction of the acid on the alcohol.

Acidum Hydrochloricum Dilutum, strength $\frac{1}{15}$, gtt. iij-v, well diluted.

Acidum Nitricum Dilutum, $\frac{1}{6}$, gtt. iij-x, well diluted.

Acidum Nitro-hydrochloricum Dilutum, Nit. Ac. 4, HCl 15, Aq. 76:—gtt. iij-x, well diluted.

Acidum Phosphoricum Dilutum, strength $\frac{1}{5}$, gtt. iij-x, well diluted.

An average dose of all the dilute mineral acids is gtt. iij-x.

Physiological Actions. The strong acids are *escharotics*, abstracting the water from the tissues, combining with the bases, destroying the protoplasm, and are very diffusible. Sulphuric carbonizes (black); Nitric tans (yellow). The dilute acids act in the stomach chemically. *Secretion* is promoted by Nitric, lessened by Sulphuric, Hydrochloric acid acting thereon between the other two. *To mouths of ducts* having an acid secretion, they check the flow; to those of alkaline secretion they promote it (*e.g.* bile, pancreatic, juice, etc.). *Fermentation* is checked by the mineral acids. *Bowels* are constipated by Sulphuric, relaxed by Nitric acid.

As these agents are synergistic to pepsin, they at first aid digestion; but if continued they lessen the production of gastric juice, and so impair digestion. Given before meals in small doses they will relieve excessive acidity of the stomach, by checking the production of the acid gastric juice.

Poisoning by the Mineral Acids is treated by Alkalies, as washing soda, soap-suds, etc., to neutralize the acid; cautiously empty the stomach;

give oil, albumen, or milk, to protect the mucous membrane. Stimulants, opium, ammonia intra-venously, to combat the resulting depressed condition of the vital powers.

Therapeutics. The mineral acids are used in—

Atonic Dyspepsia,—small doses of Hydrochloric acid with pepsin, given after meals, except where there is acidity of the stomach.

Acidity,—Hydrochloric or Phosphoric in small doses before meals.

Oxaluria,—Nitric or Nitro-hydrochloric. *Lithæmia*, Nitric acid.

Diarrhæa,—when profuse secretions, Sulphuric acid with opium.

Choleraic Diarrhæa and Dysentery,—Sulphuric with opium, or with magnesium sulphate, is found very serviceable.

Fevers,—especially typhoid,—Hydrochloric acid preferred.

Lead Poisoning,—Sulphuric, to form the insoluble sulphate of lead.

Hemorrhoids,—Sulphuric; also for hemorrhage from lower bowel.

Hemorrhages,—Sulphuric is undoubtedly effective in uterine hemorrhage from fibroids, and in other hemorrhages at points distant from the stomach; also sometimes in purpura hemorrhagica.

Chronic Hepatic Disorders,—Nitro-hydrochloric acid in all forms thereof due to malaria, internally, and locally, as a bath.

Intermittent and Remittent Fevers,—Nitric acid in full doses.

Aphonia of Singers,—Dilute Nitric acid in 10 drop doses.

Phthisis,—Aromatic Sulphuric acid for the sweats.

Local Uses. They are employed against—

Ulcers,—Fuming Nitric acid as an escharotic, also in *Gangrene*.

Hemorrhoids, of the bleeding, strawberry-pile kind,—Fuming Nitric acid.

Diseased Joints,—Counter-irritation by Brodie's liniment, composed of Sulphuric acid one-fourth, Olive oil, three-fourths.

Uterine Diseases are often treated with fuming Nitric acid, locally applied.

OILS AND FATS.

Oils and Fats used in Medicine are as follows—

Adeps,—Lard.

Oleum Amygdalæ Expressum,—Almond

Sevum,—Suet.

Oil, or Sweet Oil.

Cetaceum,—Spermaceti.

Oleum Theobromæ,—Cacao-butter.

Oleum Olivæ,—Olive Oil.

Oleum Lini,—Flaxseed or Linseed Oil.

Oleum Morrhuæ,—Cod-liver Oil.

Composition. They all (except cod-liver oil) contain olein, stearin, and margarin, in varying proportions, the olein giving fluidity, the stearin solidity. Olein, stearin, and margarin are respectively oleate, stearate

and margarate of glycerin. *Cod-liver Oil* consists chiefly of olein and margarin, with a peculiar principle,—gaduin,—also propylamin, bile constituents, and traces of sulphuric and phosphoric acids, bromine, iodine, phosphorus, iron, lime and magnesia. Linseed Oil contains much vegetable albumen, which coagulates on exposure to the air, making it a drying oil. Its olein furnishes linoleic acid, instead of oleic, when saponified.

Cod-liver Oil. Three kinds are sold,—the pale, the light-brown and the dark. The pale oil is the purest.

Physiological Actions. Fats in small quantity are necessary to the digestion of nitrogenous food (Lehmann), and form the molecular basis of the chyle. They are prepared for absorption by the pancreatic juice and the bile, especially by the latter. Fat is an essential constituent of the products of tissue formation, whether physiological or pathological, and is the chief material concerned in the formation of force. After oxidation it is excreted as carbonic acid and water. Locally applied fat reduces the body temperature.

Therapeutics. Locally, by inunction, oils and fat may be used in the scaly diseases of the skin, and in chronic wasting diseases; also in rickety and scrofulous children, and in febrile disorders, particularly the desquamative stage of scarlatina. *Cod-liver Oil* may also be used by inunction, in the foregoing disorders, but is best administered internally; and in the following,—

Chronic Forms of Phthisis.	Strumous Skin diseases and Diarrhoea.
Chronic Bronchitis and Emphysema.	Syphilo-dermata.
Chronic Rheumatic Disorders.	Neuralgia and Chorea.
Atheroma of the Arteries.	Epilepsy.

Cod-liver Oil is best administered in small doses, a teaspoonful thrice a day for an adult, in black coffee, beer or lemon juice. One drop of the Essential Oil of Eucalyptus will extinguish the odor and taste of 100 drops.

PHOSPHORUS.

Preparations.

Oleum Phosphoratum, Phosphorated Oil; strength $\frac{1}{100}$, ℥j—v.

Pilula Phosphori, Pills of Phosphorus; each contains gr. $\frac{1}{100}$ of Phos.

* *Tinctura Phosphori* (Thompson's); each ʒ contains gr. $\frac{1}{33}$.

* *Tinctura Phosphori* (Bellevue Hosp.); each ʒ contains gr. $\frac{1}{12}$.

Zinci Phosphidum, Phosphide of Zinc; gr. $\frac{1}{50}$ — $\frac{1}{30}$. Is irritant.

Physiological Actions. Phosphorus in small doses is a stimulant to the growth of the bones, to the genital function, and to the brain, circula-

tion and stomach. It aids digestion by irritating the end organs of the stomach nerves, and causes eructations of phosphide of hydrogen. Its fumes cause necrosis of the upper or lower jaw bones, especially in those whose teeth are decayed; but this may be prevented by the inhalation of the fumes of old acid turpentine. *In poisonous doses* it is a powerful gastro-intestinal irritant, causing vomiting and purging, with great depression; reaching the blood as phosphorus it destroys the red corpuscles, causing acute hemorrhages, from fatty degeneration of the arterial walls, rapid steatosis of the stomach, liver and heart, with deep jaundice; then delirium, convulsions, coma and death, generally from gradual failure of the respiration and circulation.

Antagonists. Sulphate of Copper is the best emetic, forming a nearly insoluble phosphide of copper, 3-grain doses in dilute solution every five minutes until emesis. Hydrated Magnesia as a quickly acting purgative. Lime water or Charcoal to prevent its action on the tissues. The antidote is the common *commercial Oil of Turpentine* (Bartholow), crude French Acid Turpentine (Wood), which has been exposed to the air for some time. Transfusion has been efficacious in repairing the blood. No oils or fats, as they dissolve phosphorus and promote its absorption.

Acute Phosphorus Poisoning most resembles Acute Yellow Atrophy of the Liver; so much so that it is generally impossible to distinguish between them.

Therapeutics. Phosphorus is used in—

Chronic Nervous Exhaustion, when the nerve centres are implicated.

Neuralgia requires large doses, gr. $\frac{1}{2}$, or 3j of the Bellevue Tincture.

Anæmia, pernicious anæmia, and their results; small doses.

Wakefulness of the aged, and from cerebral anæmia; small doses.

Impotence, of functional character; no remedy more efficient here.

Progressive Locomotor Ataxia is decidedly ameliorated by Phosphorus.

Skin Diseases; as a substitute for Arsenic in acne, psoriasis and lupus.

Paraplegia, of myelitic origin, from excessive venery.

Osteomalacia and Rachitis are much benefited by Phosphorus.

Threatened Cerebral Softening, in which no other drug seems to affect the nerve centres as Phosphorus does.

PHOSPHATES AND PHOSPHITES.

Preparations.

Calcii Phosphas Præcipitatus, Precipitated Phosphate of Calcium, gr. j-x.

Syrûpus Calcii Lactophosphatis, Syrup of the Lactophosphate of C., 3j.

Sodii Phosphas, ʒj-ʒij. *Sodii Pyrophosphas*, ʒss-ʒj.

Syrupus Hypophosphitum cum Ferro, Syrup of H. with Iron, ʒj-ʒij.

**Syrupus Phosphatum Compositus*, Compound Syrup of the Phosphates, Parrish's Chemical Food,—each drachm contains gr. 2½ of Phosphate of Iron, and gr. 1 of Calcium Phosphate.

Physiological Actions. *Phosphate of Calcium* is an essential ingredient of all the tissues, forming more than 50 per cent. of the bones. Lactic and H Cl Acids dissolve it in small quantities. In the blood it increases its alkalinity and its power to hold carbonic acid, and it diminishes the excretion of urea. *Phosphate of Sodium* acts similarly on the blood and urea, and increases secretion, especially of the bile, being an excellent cholagogue; thereby aiding the digestion of fats. In ounce doses it is laxative.

Therapeutics. *Phosphate of Calcium and the Hypophosphites* are used with advantage in all diseases of mal-nutrition, and where the repair or development of the bones is required. They are particularly useful in—Protracted Suppuration. Rachitis. Scrofulosis. Anæmia and Bone Soft-Osteo-malacia. Caries. Chronic Phthisis. Ending of Lactation.

Phosphate of Sodium, in ʒ doses ter die for adults, gr. x-xx for children, is extremely useful in conditions depending on catarrh of the bile ducts and duodenum, as headache, jaundice, chalky stools, etc. Gall stones may be prevented from forming by scruple or drachm doses before meals, for months. It is also good for—

Obesity.	Incipient Hepatic Sclerosis.	Cerebral Debility.
Diabetes.	Chronic Infantile Diarrhoea.	Bilious Sick-headache.
Pasty white stools of ill-conditioned children.		

FERRUM,—Iron.

Chief Preparations of Iron, and their doses.

Tinctura Ferri Chloridi, ℥ v-xx. Strength $\frac{3.5}{100}$.

Mistura Ferri et Ammonii Acetatis, Basham's Mixture, a tablespoonful well diluted, 3 or 4 times a day. Has of Tinct. Ferri Chlor. 2 per cent.

Massa Ferri Carbonatis, Vallet's Mass, gr. j-v.

Ferri Sulphas Exsiccatus, gr. ss-ij, in pill or solution.

Syrupus Ferri Iodidi, ℥ v-xl, well diluted and taken through a quill.

Ferrum Reductum, Iron by Hydrogen, gr. ss.-gr. ij, after meals.

Ferri Oxidum Hydratum, A soft magma, only used as an antidote to Arsenic, prepared by adding 10 parts of Solution of Tersulphate of Iron to 8 parts of Aqua Ammonizæ, and sufficient Water.

Liquor Ferri Subsulphatis, Monsel's Solution. Used only as a styptic.

**Ferrum Dialysatum*, Dialysed Iron, \mathfrak{m} v- \mathfrak{z} j. Highly valued by many physicians, and unqualifiedly condemned by others.

Physiological Actions. It is present in the blood (1 part to 230 of red corpuscles), also in the bile, lymph, gastric juice, etc. Given medicinally, in small doses, it improves the blood, increasing the number of the red corpuscles, and promoting the appetite and digestion. In large doses, nausea and vomiting are produced by the soluble preparations; the iodide, chloride, nitrate and sulphate being active irritant poisons. Nearly all the preparations are more or less astringent, and act injuriously on the teeth. But a small portion is absorbed, the rest being eliminated by the intestinal canal, blackening the fæces by conversion into tannates and sulphides. The tincture of the chloride is diuretic.

Therapeutics. The chief indication for Iron is anæmia; when plethora exists it is contra-indicated. It should be given after meals, and occasionally suspended for a time, to avoid deranging the digestion.

Pseudo-Leucocythæmia is much benefited by chalybeates.

Syphilitic Cachexia is greatly influenced by the Iodide of Iron.

Acute Rheumatism, in anæmic subjects only; in them highly useful.

Chorea, of anæmic girls, about the age of puberty,—with purgatives.

Neuralgia, of the anæmic,—large doses of the Tincture of the Chloride.

Cardiac Disorders, fatty heart, weak heart, dilatation, mitral disease.

Nocturnal Incontinence of Urine in delicate children,—the Syrup of the Iodide, \mathfrak{m} xv-xx ter die.

Menstrual Disorders, due to anæmia, especially amenorrhœa.

Hemorrhages, of every form, are combated with Monsel's Solution, locally.

Chronic Bright's Disease, the Tinct. Ferri Chlor. as a chalybeate diuretic.

Erysipelas, half-drachm doses of the Tinct. Ferri Chlor. every four hours in very many cases controls the disease; how is not known.

To promote appetite and digestion,—the Sulphate in pill, or the official Pil. Aloes et Ferri.

MANGANUM,—Manganese.

Preparations.

Mangani Oxidum Nigrum, the Black Oxide, gr. ij-x in pill.

Mangani Sulphas, gr. ij-v. Freely soluble in water, and of bad taste.

Potassii Permanganas, gr. ss.-gr. j, in distilled water.

**Syrûpus Ferri et Mangani Iodidi*, \mathfrak{m} x-xxx.

**Ferri et Mangani Carbonas Saccharatus*, gr. v-xx. Is tasteless.

Physiological Actions. The salts of Manganese in small doses improve the appetite and digestion, and stimulate the action of the heart. In larger doses they lower the heart's action, paralyze the muscular system, especially the muscular coat of the arteries, causing progressive wasting, paraplegia, and acute fatty degeneration of the liver. They are gastro-intestinal irritants, and the sulphate is a decided cholagogue. Manganese is closely associated with iron in the blood, bile, etc.

Therapeutics. Manganese is prescribed in—

Anæmia and Chlorosis, in combination with Ferric preparations.

Cachexiæ of various kinds,—the Syrup of the Iodide of Iron and Mang.

Hepatic Disorders, and catarrh of the bile ducts,—the Sulphate.

Chronic Skin Diseases,—the oxide as an ointment.

Gastrodynia and Pyrosis,—the purified Oxide in doses of gr. x–xv.

Uses of Permanganate of Potassium. As an antiseptic and oxidizing agent it is used in diphtheria, scarlatina, septicæmia, etc., and is given with benefit in dyspepsia, lithæmia and obesity. Locally as a deodorizer in cancer, ozæna, otorrhœa, foul breath, and fetid perspiration of the feet.

BISMUTHUM,—Bismuth.

Preparations.

Bismuthi Subcarbonas, gr. xv– \mathfrak{z} j. { Are both nearly insoluble, so that
Bismuthi Subnitras, gr. xv– \mathfrak{z} j. { large doses may be given in powder
or emulsion.

Physiological Actions. Are chiefly local as a sedative to the end organs of the nerves, though a minute quantity passes into the blood, acting as a tonic, promoting the constructive metamorphosis by increasing the appetite and digestion. The preparations are freely astringent, and produce constipation after a time, rendering the stools and tongue of a dark clay color, from their conversion into a sulphide. Toxic effects, when occurring, are due to Arsenic, with which the commercial preparations are usually contaminated.

Therapeutics. The salts of Bismuth are given internally in most forms of disordered digestion, vomiting, and diarrhœa, but large doses are necessary to be efficacious. The best vehicle for them is milk. They are well used in—

Acute Gastritis.	Vomiting of Children.	Diarrhœa of ty-
Gastralgia, Gastric Ulcer.	Vomiting of Pregnancy.	phoid fever,
Acute Indigestion.	Gastro-intestinal Disorders	and phthisis.
Aphthæ.	of Children.	Chronic Diarrhœa.

Locally, they may be applied with advantage in cases of—

Stomatitis.	Eczema.	Gonorrhœa.
Nursing Sore Mouth.	Intertrigo.	Gleet.
Acne Rosacea.	Conjunctivitis.	Leucorrhœa.

ARSENICUM,—Arsenic.

Preparations.

Acidum Arseniosum, White Arsenic, gr. $\frac{1}{40}$ — $\frac{1}{10}$. Soluble in water, 1 to 33.

Liquor Acidi Arseniosi, Solution of Arsenious Acid, $\frac{1}{100}$, ℥j-v.

Liquor Potassii Arsenitis, Fowler's Solution, strength $\frac{1}{100}$, ℥j-x.

Liq. Arsenii et Hydrargyri Iodidi, Donovan's Sol., strength $\frac{1}{100}$, ℥j-v.

Liquor Sodii Arsenitis, Pearson's Solution, strength $\frac{1}{100}$, ℥ij-xx.

Arsenii Iodidum, gr. $\frac{1}{80}$ — $\frac{1}{10}$. Is perfectly soluble in water.

Arsenic Poisoning is treated by prompt evacuation of the contents of the stomach. Antidote is the *Hydrated Oxide of Iron* freshly precipitated and in quantity 8 parts for 1 of the poison. Then oil, milk, or mucilaginous drinks, to protect the mucous membrane; and diluents, alkaline mineral waters, Iodide of Potassium, etc., to promote elimination.

Hydrated Oxide of Iron. Ten troy ounces of Solution of Tersulphate of Iron diluted with 100 parts of cold water are added to eight troy ounces of Aqua Ammonia previously diluted with 20 parts of cold water, constantly stirred, and the precipitate washed, and added to 20 parts of cold water. *Extemporaneously* the same preparation may be formed by adding Carbonate of Sodium to Tincture of the Chloride of Iron, or Calcined Magnesia to Monsel's Solution.

Chronic Arsenical Poisoning may be avoided by commencing with full doses (℥x of Fowler's solution), then reducing the dose regularly. Unless very small doses are used, Arsenic should always be given just after meals.

Physiological Actions.—Arsenic is a very painful escharotic, exciting violent inflammation. Taken internally it is a powerful irritant to the gastro-intestinal and bronchial mucous membranes.

In Small Doses, Arsenic is a stomachic tonic, promoting the appetite and digestion; increases cardiac action, respiratory power, and the secretions of the intestinal tube; stimulates the mind, the sexual appetite, and intestinal peristalsis; causes rotundity of form and a fair skin. When tolerance is established, large doses are taken with impunity, as by the arsenic-eaters of Styria.

In Full Medicinal Doses continued, it produces cedema and itching of the eyelids, increased saliva, nausea, vomiting of mucus, diarrhœa or dysentery, epigastric pain and soreness, irritable and feeble heart, dyspnœa, disordered sensibility, herpes zoster, urticaria, eczema and other skin eruptions, jaundice and albuminuria.

In Toxic Doses, the phenomena may be either gastro-intestinal or profoundly cerebral in character. In the first and most usual form, there is burning pain at the stomach, extending over the abdomen, vomiting, thirst, bloody stools, strangury, suppressed or bloody urine, a rapid and feeble heart, great anxiety, cold breath, albuminuria, collapse. In the nervous form, profound coma, like that of opium narcosis, comes on suddenly, and without any gastro-intestinal symptoms.

Post-mortem shows erosions, ecchymoses, and softening of the gastro-intestinal mucous membrane, congestion of the lungs and the bronchial mucous membrane, fatty degeneration of the internal organs, especially the liver and kidneys.

Therapeutics. Arsenic is very useful in—

Stomach Disorders, as chronic gastric catarrh, irritative dyspepsia, chronic gastric ulcer, cancer of the stomach, gastralgia, and vomiting due to these affections. Very small doses here, gr. j of Fowler's solution.

Bronchial and Pulmonary Affections, as chronic catarrhs, chronic phthisis, spasmodic asthma, acute coryza, hay fever, etc., are much benefited by smoking arsenical cigarettes.

Diarrhœas and Dysentery, chronic and choleraic.

Liver Disorders, of malarial origin, and catarrhal jaundice.

Anæmia and Chlorosis, to promote constructive metamorphosis.

Vomiting of Pregnancy, gr. j of Fowler's solution before each meal.

Weak Heart, with dyspnœa and cedema of the feet and ankles.

Chorea, large doses, $\mathfrak{m}\mathfrak{v}$ thrice daily, are very useful.

Malaria is well treated by Arsenic as an adjunct to Quinine.

Epithelioma, and many other forms of cancer, are retarded by it.

Chronic Skin Diseases, particularly psoriasis, and eczema squamosum, and those affecting the superficial strata of the integument.

Rheumatoid Arthritis has been well treated with Arsenic.

Locally, Arsenical paste is used as an escharotic in cancer, but is excessively painful. It is a good depilatory.

BITTERS.

Bitters are divided into the Simple Bitters and the Aromatic Bitters. The latter contain Gallic and Tannic acids, besides aromatic constituents, and are, therefore, more or less astringent. There are also certain special bitters, Eucalyptus, Hydrastis, Cinchona, etc., which will be treated of separately.

Simple Bitters, their peculiar principles, their Preparations and doses.

Quassia,—The wood of *Picræna excelsa*. Principle, *Quassin*.

Extractum Quassiæ, gr. j–iij. *Tinctura Quassiæ*, ℥v–℥j. *Extractum Quassiæ Fl.*, ℥ss–℥j.

Gentiana, *Gentian*,—The root of *Gentiana lutea*. Composition, *Gentianin*, *Gentesic Acid*.

Extractum Gentianæ, gr. j–v. *Extr. Gentianæ Fl.*, ℥ss–℥ij.

Tinctura Gentianæ Composita, ℥ss–℥ij. Contains Cardamom 2, Bitter Orange Peel 4, Gentian 8, Dilute Alcohol to 100 parts.

**Mistura Gentianæ Alkalina*, ℥j–℥iv. Contains Bicarb. of Sodium, gr. xv, Dil. Hydrocyanic Acid, ℥ij, Infusi Gentianæ Co. ℥j.

**Mistura Gentianæ et Sennæ*, ℥j–℥vj. Infusum Sennæ ℥iij, and Tinct. Cardamomi ℥j, Infusi Gentianæ Co. ℥vj.

Calumba, *Columbo*,—The root of *Jateorrhiza Calumba*. Composition, *Berberina*, *Colombin*, *Columbic Acid*.

Extractum Calumbæ Fluidum, ℥ss–℥ij. *Tinctura Calumbæ*, ℥ss–℥ij.

Cornus, *Dog-wood*.—The bark of the root of *Cornus florida*.

Extractum Cornûs Fluidum, ℥x–℥j.

Aromatic Bitters, their Principles and Preparations.

Serpentaria, *Virginia Snake-root*,—Described under Cardiac Stimulants.

Prunus Virginiana, *Wild Cherry*,—The bark of *Prunus serotina*. Composition, *Amygdalin* and *Emulsin* (which by their mutual reaction with water produce Hydrocyanic Acid), Tannic and Gallic Acids, etc.

Extractum Pruni Virginianæ Fluidum, ℥ss–℥j.

Infusum Pruni Virg., ℥ss–℥ij. *Syrupus Pruni Virg.*, ℥j–℥ij.

Cascarilla,—The bark of *Croton Eluteria*. Composition, *Cascarillin*, Tannic Acid, etc. **Infusum Cascarillæ*, ℥ss–℥j.

Physiological Actions. *The Simple Bitters* increase appetite and aid digestion, thus promoting the constructive metamorphosis. They increase the mucous secretion, the flow of saliva and of gastric juice. As

they also increase the gastric mucus, their continued use will set up gastric catarrh, and interfere with digestion. *The Aromatic Bitters* have similar properties; and in addition, a local stimulant action upon the alimentary canal, due to the presence of a volatile oil, as well as decided astringent qualities from their Tannic and Gallic Acids. *Cornus* is a good anti-periodic.

Therapeutics. They are used as tonics chiefly in—

Atonic Dyspepsia, with pain after eating,—Quassia or Calumba.

Convalescence,—to promote the appetite and to aid digestion.

Diarrhœa, depending on indigestion, or an irritable intestinal mucous membrane,—Gentian or Calumba.

Flatulence,—an infusion of Calumba, Ginger, aa \mathfrak{z} ss, and Senna \mathfrak{z} j.

Malaria, *Cornus*, as a tonic and antiperiodic, has considerable repute.

Bronchial Catarrh,—*Prunus Virginiana* has a domestic reputation.

Hectic Fever, from any source,—*Prunus Virginiana* is an efficient tonic.

Ascarides Vermiculares,—Quassia internally, and as an enema.

Cough of Phthisis,—*Prunus Virginiana* in cold infusion.

As Vehicles, the various bitter infusions are much used. The Syrup of Wild Cherry is an ingredient of almost every cough mixture.

EUCALYPTUS,—Blue Gum-tree.

Eucalyptus and its Composition. The leaves of *Eucalyptus globulus*, or Blue Gum-tree, a native of Australia, now grown in California, Italy, etc. It contains tannic acid, a Volatile Oil, a fatty acid, and a resin which is resolvable into *Turpene*, *Cymol*, etc. The oil consists of three oils, which distil over at different temperatures, the first product being *Eucalyptol*.

Preparations.

Extractum Eucalypti Fluidum, \mathfrak{m} x— \mathfrak{z} j.

Oleum Eucalypti, \mathfrak{m} v—xx in emulsion or capsules.

Physiological Actions. It promotes appetite and digestion, increases the flow of saliva, gastric juice, and the intestinal secretions. It increases the heart's action, and lowers the arterial tension. In large doses it causes great muscular weakness, lowered temperature, nausea and vomiting, indigestion, diarrhœa, and if continued will irritate and congest the kidneys. It reduces the size of an enlarged spleen, and has anti-malarial properties absorbing noxious germs, as well as enormous quantities of water from the soil, and by its emanations purifying the atmosphere in its vicinity. It is largely cultivated in malarial districts for these properties, and has

rendered habitable a portion of the deadly Roman Campagna. It is destructive to low forms of life.

Eucalyptus is diaphoretic, and a stimulating expectorant. It is eliminated by the skin, bronchial mucous membrane and kidneys, imparting its odor to the breath and urine, being more or less irritant at the points of elimination.

Therapeutics. Eucalyptus is well administered in—

Chronic Catarrhal Affections of the genito-urinary organs, the bronchopulmonary mucous membrane, and the bladder, especially the latter.

Bronchitis, acute and chronic,—in the former after the most acute stage.

Asthma,—the leaves smoked in combination with Stramonium, Belladonna.

Chronic Gastric Catarrh, and conditions of the intestinal canal which favor the development of parasites.

Cachexia, and Convalescence,—as a tonic and stimulant.

Stomatitis and Tonsillitis,—a decoction of the leaves, locally.

Ulcers,—as a disinfectant, it destroying low forms of life.

Hysteria, Choreia, etc., in debilitated persons.

Malaria,—as a reconstructant, Eucalyptus is better than Quinine.

Intermittent Fever, in which Eucalyptus has some utility, especially in obstinate cases, where it is desirable to stop the use of Quinine.

HYDRASTIS,—Golden Seal.

Hydrastis is the root of *Hydrastis Canadensis*, and contains three alkaloids,—*Hydrastine, Berberine* and *Xanthopuccine*, with Tannic and Gallic Acids, etc. Its preparations are—

Extractum Hydrastis Fluidum, ℥v-℥ss. *Tinctura Hydrastis*, ℥x-℥j.

Physiological Actions.—*Hydrastis* is an astringent bitter, promotes appetite and digestion, increases the secretions of the gastro-intestinal tract, and the flow of bile. Long used, it deranges digestion and causes constipation. It is an anti-periodic, and a protoplasmic poison, arresting the movements of the white blood corpuscles.

Therapeutics. *Hydrastis* is chiefly used as a stomachic tonic, as anti-periodic, a mild astringent, and an antiseptic. In—

Catarrh of the stomach, duodenum, gall ducts, intestine, bladder, uterus, vagina, gonorrhoea, gleet, chronic nasal catarrh, it is an excellent remedy, both locally and internally.

Syphilitic Affections, of the mouth, throat and nares,—fl. ext. locally.

Ulcers and Sores, of unhealthy character,—locally applied.

Stomatitis, both mercurial and aphthous,—the fluid extract locally.

Constipation, when due to deficient intestinal secretion.

Rectal Fissure and Hemorrhage,—the fluid extract locally.

Intermittents,—here Hydrastine stands next after Quinine.

Malarial Poisoning,—the fluid extract with Iron preparations.

CINCHONA,—Peruvian Bark.

Official Species of Cinchona are three, viz.—

(1). *Cinchona*,—the bark of any species of Cinchona, containing at least 3 per cent. of its peculiar alkaloids.

(2). *Cinchona Flava*, Yellow or Calisaya bark,—the bark of *C. Calisaya*.

(3). *Cinchona Rubra* Red bark,—the bark of *Cinchona succirubra*.

Another variety, *Cinchona pallida*, Pale bark, is found in the shops, but is not official, having been dismissed from the last edition of the U. S. Pharmacopoeia.

Peculiarities possessed by each variety. They should contain not less than three per cent. of the alkaloids and at least 2 per cent. of Quinine. Yellow bark contains most Quinine, Pale bark most Cinchonine, while the Red bark has these alkaloids in about equal proportions. The tree is a native of the western mountains of S. America, and has been planted largely in India, Ceylon and Burmah. The bark from Columbia affords no alkaloids except Quinine.

Composition of Cinchona. It contains 4 chief alkaloids and 17 others, also 2 simple acids, 2 tannic acids, a resinoid, and coloring matter, as follows,—

ALKALOIDS, 4,—

Quinina, Quinine,—the most valuable.

Quinidina, Quinidine,—the strongest antiperiodic, but it exists in very small quantity.

Cinchonina, Cinchonine,—the least valuable.

Cinchonidina, Cinchonidine,— $\frac{1}{2}$ the strength of Quinine.

ACIDS, 4,—

Kinic. *Kino-tannic.*

Kinovic. *Kinovo-tannic.*

OTHER CONSTITUENTS—

Kinovin,—a resinoid.

Cinchona Red.

Chinoidin, Quinetum, and Quinquina. *Chinoidin* is the black, bitter residue left after the crystallizable alkaloids have been removed from the mother-liquor, and it evaporated. It contains the four alkaloids in amorphous condition, and has one-fourth the strength of Quinine. *Quinetum* (also called *Quinquina*) is an impure preparation, much used in India. It contains all the alkaloids, the woody fibre being removed, and is half as strong as Quinine.

Preparations.

Infusum Cinchonæ, $\overline{3}$ ss– $\overline{3}$ ij. Cinchona 6i, Aromatic Sulphuric Acid i, Water 93. Is the only official infusion containing Sulphuric Acid.

Tinctura Cinchonæ, strength 20 per cent. $\overline{3}$ ss– $\overline{3}$ ij.

Tinctura Cinchonæ Composita, a substitute for Huxham's Tincture of Bark, strength 10 per cent., $\overline{3}$ j– $\overline{3}$ ss. Contains Cinchona Rubra 10, Serpentaria 2, Orange Peel 8, Glycerin 10, Alcohol, Water, aa q. s. ad. 100.

Quininæ Sulphas, Sulphate of Quinine, gr. j–xx, even xl. Soluble in 740 parts of cold water, and in small proportions of acidulated water.

Cinchonidinæ Sulphas, Sulphate of Cinchonidine, gr. ij–xxx. It is being much used, especially in hospital and dispensary work.

Incompatibles. Free Tannic Acid is incompatible with the infusion. Iodine, Alkalies, Alkaline carbonates and earths are incompatible with the alkaloids, the first named forming insoluble compounds, and the latter precipitating them from solution.

Antagonists. As to its cerebral action *Morphine* is antagonistic; *Belladonna* or *Atropine* to its nervous, cardiac, and antipyretic powers.

Physiological Actions. Cinchona is an astringent bitter, an antiseptic antiperiodic, antiphlogistic and antimiasmatic, a diminisher of reflex action, a protoplasmic poison, and probably an oxytocic. Its alkaloids are rapidly diffused and slowly excreted, being found in the urine in $\frac{1}{4}$ of an hour after administration, and for three days afterwards. At first it promotes appetite, digestion, the flow of saliva and of gastric juice; but long continued it sets up a gastric catarrh, impedes digestion and causes constipation. It arrests the movements of the white blood corpuscles, though increasing their number; and prevents acetification and decay of the blood. *The Heart* and arterial tension are somewhat stimulated by small doses, but depressed by large ones (gr. xl–lxx), which slow and enfeeble the pulse, the drug acting directly on the cardiac ganglia. *The Brain* is exhilarated by small doses, large ones causing anæmia, pallor, a sense of fullness and constriction in the head, singing in the ears, vertigo, a staggering gait, amaurosis and deafness (though the eyes and ears are rarely ever injured seriously), great headache, coma, dilated pupils, delirium, and in animals convulsions. These symptoms collectively are termed "Cinchonism." *The Reflex Function* of the cord is lowered very markedly by large doses. *The Spleen* is reduced in size, and the temperature of pyrexia lowered, though it does not depress the body temperature in health. In some subjects it causes sexual excitement, in others cutaneous eruptions followed by desquamation; it lessens the excretion of uric acid, but not that of urea;

and is a uterine stimulant in labor. Its power to initiate uterine contractions is still a much debated question.

Therapeutics. The principal use of Cinchona is in the malarial diseases, over which its influence is that of a specific. In—

Intermittents,—gr. x of Quininae Sulphas in the sweating stage and again five hours before the expected time of the next paroxysm. *Arsenic* in the intervals, in lieu of Quinine, which will cause a daily exacerbation of temperature if long continued.

Remittent Fever,—gr. xx—xxx once or twice a day, until the temperature is reduced to the normal point.

Pernicious Fever,—large doses, gr. xxx—lx, are necessary to safety.

Chronic Malarial Poisoning,—Chinoidin is more effective than Quinine.

Prophylactic, against malaria,—Quinine, gr. ij—ijj per diem, is effective.

Inflammations, at their inception, may be aborted by Quinine, gr. xv—xx combined with Morphine, which here is synergistic to it.

Acute Tonsillitis, may sometimes be aborted by Quinine in full dose.

Acute Catarrh may often be aborted by Quinine, gr. x, Morphine, gr. $\frac{1}{4}$.

Surgical Fever, and before surgical operations, Quinine is much used.

Septicæmic fevers, and Hectic, are well treated with Quinine and Alcohol.

Neuralgias, of the ophthalmic division of the 5th, and when due to malaria.

Skin Diseases, especially erythema nodosum, and erysipelas.

Eruptive Fevers, especially scarlet fever and measles, throughout course.

Hay-asthma, a solution of the neutral chloride, applied locally, gr. vj ad $\overline{3}$ j.

As a Tonic, the Infusion or Compound Tincture is best with a mineral acid; has many applications, as in atonic dyspepsia, gastric catarrh of drunkards, adynamic states, convalescence, asthma, chronic bronchitis, insanity, and generally in weak subjects of flabby flesh and perspiring skin.

POTASSIUM.

Preparations.

Potassa, Caustic Potash, Hydrated Protoxide of Potassium. A painful escharotic, acting deeply; soluble in 0.5 of water.

Liquor Potassæ, Solution of Potassa, mjj—xv, well diluted with water.

Potassii Acetas, gr. x— $\overline{3}$ j.

Potassii Citras, gr. v— $\overline{3}$ ss.

Potassii Carbonas, gr. ij—x.

Potassii Chloras, gr. v—xv.

Potassii Nitras, Nitre, gr. ij—x.

Potassii Bichromas, gr. $\frac{1}{5}$ — $\frac{1}{2}$.

Potassii Bitartras, Cream of Tartar, gr. v— $\overline{3}$ j. Sol. in 210 of water.

Potassii et Sodii Tartras, Rochelle Salt, gr. x— $\overline{3}$ ss. Sol. in 2 $\frac{1}{2}$ of water.

[*Potassii Bromidum* is treated of under BROMIDES, page 100; *Potassii*

Permanganas under MANGANESE, page 24.]

Physiological Actions. Caustic Potash, like the other caustic alkalies, destroys the tissues by combining with their water, dissolving the albumen and saponifying the fats. The Potassium Salts increase the saliva, promote oxidation and the retrograde metamorphosis; in small doses on an empty stomach they promote the formation of acid gastric juice by favoring the outward osmosis of its constituents from the blood; in large doses they act chemically in the stomach, neutralizing its free acids, and disordering digestion. *The Bicarbonate*, given on an empty stomach, enters the blood unchanged, meets the neutral phosphate of sodium, forming the acid phosphate, and making the urine more acid. On a full stomach it is decomposed before entering the blood, and makes the urine less acid. *The Vegetable Acid Salts* (acetate, citrate, etc.) enter the blood in their own form, are there decomposed, forming CO_2 , alkalinizing the blood and urine; and are diuretics, increasing the water and the excretion of solids in the urine. *The Mineral Salts* (nitrate, chlorate, etc.) are not decomposed in the blood, but are eliminated in their own form; the Nitrate being a most active diuretic, the Chlorate irritating the kidneys, and causing albuminuria. In large doses these salts decompose the red corpuscles of the blood, and paralyze the motor ganglia of the heart. *All Potassium Salts*, in large doses, are cardiac poisons, muscular paralyzers, poisonous to protoplasm, especially to nerve tissues, and destructive to the ozonizing function of the blood.

Poisoning by Caustic Alkalies is treated by the Vegetable Acids, as vinegar, lemon-juice; then demulcents and oils to protect the mucous membrane, and measures to support the vital powers.

Therapeutics. As Alkalies the Potassium salts are used in—
Acute Rheumatism,—the Bicarbonate and Nitrate, to saturate the blood, and make the urine alkaline; is effective treatment for sthenic patients.
Lithæmia,—the Acetate or Citrate, to promote oxidation. If the Bicarb. is given, it should be during digestion, to render the urine less acid.
Acidity and Atonic Dyspepsia—the Bicarbonate, or Liquor Potassæ with a bitter, in small doses before meals. If given after meals larger doses are required for temporary alleviation by neutralizing the food acids.
Mouth Affections, as ulcerative stomatitis, aphthæ, nursing sore mouth, follicular pharyngitis,—the Chlorate locally in full doses. This salt must be cautiously used, as it is a dangerous irritant to the kidneys.
Inflammations, Acetate, to promote the excretion of resulting products.
Cardiac Dropsy, if general,—the Bitartrate in infusion of Juniper.
Acute Desquamative Nephritis,—the Bitartrate, but not in Juniper infusion.

Skin Affections, as acne, eczema, prurigo, etc., alkaline solutions, locally. *Catarrhs*, nasal, buccal, or vaginal,—the Bichromate (gr. j-x ad $\frac{3}{4}$ iv aquæ) locally.

SODIUM.

Preparations.

Liquor Sodæ, Solution of Soda, \mathfrak{m} j-x, well diluted with water.

Sodii Bicarbonas, gr. v- $\frac{3}{4}$ j.

Sodii Boras, Borax, gr. ij-xx.

Sodii Sulpho-carbolas, gr. j-x. (See page 126.)

Pulvis Effervescens Compositus, Seidlitz Powder. *Sodii Bicarb.*, gr. xl ; *Potassii et Sodii Bitartras*, gr. cxx ; *Acidum Tartaricum*, gr. xxv.

Sodii Phosphas is treated of under PHOSPHATES. *Sodii Bromidum* under BROMIDES, page 100.

Physiological Actions are similar to those of Potassium, except that the Sodium salts are feebler alkalies, are not depressant, and are not cardiac or nerve poisons. The Chloride exists normally in the blood, where it keeps the fibrin and albumen in solution ; and in inflammation, being thus needed, it accumulates at the seat of the morbid action, disappearing from the urine ; its reappearance therein being a sign of improvement.

Therapeutics. Internally the Sodium salts are not much used, the Potassium and Lithium salts being preferred. Locally in—

Burns, a saturated solution of the Bicarbonate is an agreeable application.

Skin Diseases, as eczema, acne, prurigo, pityriasis, fetid sweats.

Freckles may be removed by a saturated solution of Borax in rose-water.

Intussusception may be treated by effervescing powders, the soda being first injected, then the acid. Danger, rupture of the bowel,

Narcotic Poisoning,—the same method, as an emetic.

Seidlitz Powders are used as refrigerants and gentle laxatives.

In Lithæmia, Acid Urine, and Acidity of the Stomach, the Sodium salts should not be used ; Potassium or Lithium salts are preferred.

LITHIUM.

Preparations.

Lithii Citras, gr. v-x. Extemporaneously prepared by adding Citric Acid to a solution of the Carbonate in water.

Lithii Carbonas, gr. ij-x. *Lithii Bromidum*, gr. v-xx.

Physiological Actions. It acts purely as an alkali, being the most decided alkali of the group.

Therapeutics are but few. In the—

Indigestion and Rheumatism of the obese, the Lithium salts are useful.

Lithæmia is best treated by the Citrate of Lithium.

Chronic Rheumatic Arthritis,—the Bromide, both internally and locally.

Myalgia,—the Bromide of Lithium is very useful.

CALCIUM.

Preparations.

Liquor Calcis, Lime-water, ℥ss–ij. *Mistura Cretæ*, Chalk mixture, ℥j–

Syrupus Calcis, ℥ss–ij. ℥ss.

Calcii Carbonas Præcipitatus, gr. *Creta Præparata*, Prepared Chalk,
v–xx. gr. v–xx.

**Testa Præparata*, Oyster shell, gr. v–xx.

Calcii Phosphas is treated of under the title PHOSPHATES, page 22, and
Calx Sulphurata under SULPHUR, page 39.

Physiological Actions. Feebly alkaline, the preparations of Calcium are mere astringent antacids. The actions of the Phosphate have already been described. *Syrupus Calcis* is the antidote to Carbolic Acid, or Oxalic Acid poisoning.

Therapeutics. *Lime-water* is used in the summer vomiting of children, and is added to their milk when the latter is not well retained. *Chalk mixture* is prescribed in the diarrhœa of children, with sour-smelling watery stools. In *Diphtheria and Croup*, the vapors of slaking lime, or lime-water spray, are often very serviceable.

AMMONIUM.

Aqua Ammoniæ, Water of Ammonia,—an aqueous solution of the gas, of $\frac{1}{16}$ strength by weight. Dose, ℥v–xxx, well diluted.

Ammonii Carbonas, Carbonate of Ammonium, gr. ij–x.

Ammonii Chloridum, Sal Ammoniac, gr. j–xx.

Linimentum Ammoniæ, Aqua Ammon. 30, Cotton-seed Oil, 70.

Liquor Ammonii Acetatis, Spirit of Mindererus, ℥j–℥j. Prepared by dissolving the Carbonate in dilute Acetic Acid.

Spiritus Ammonii Aromaticus, ℥x–℥ij. The Carbonate with Aromatics.

**Raspail's Eau Sédatif*.—Aqua Ammoniæ, ℥ij, Sodii Chloridum, ℥ij, Camphorated Spts. of Wine ℥iij, Aqua ℥xxxij.

The Bromide is treated of under the heading BROMIDES, page 100, and the Iodide under IODUM, page 41.

Physiological Actions. *Ammoniacal Gas* is intensely alkaline, and irritant to mucous membranes; inhaled, it causes spasmodic cough and a sense of suffocation, prolonged inhalation inducing violent inflammation and oedema of the glottis. It exists normally in the blood, to maintain its fluidity by keeping its fibrin in solution. *The Aqua*, swallowed, sets up violent inflammation of the passages and the stomach, and may cause stenosis of the pylorus. *Its salts*, in medicinal doses, act as stimulant expectorants, diffuse rapidly, and stimulate the heart's action; continued, they produce rapid emaciation, from the impaired digestion and increased tissue-waste set up. In large quantity, they injure the structure of the red blood corpuscles. *The Chloride* has decided cholagogue powers, increases the excretion of urea, and is purgative in 20-grain doses.

Antagonists. When inhaled, give HCl vapors, by inhalation, to form the Chloride; if in solution, give Vegetable Acids, and demulcents to protect the mucous surfaces. Therapeutically, its antagonists are the cardiac sedatives, Aconite, Digitalis, Veratrum, etc.

Therapeutics. As a stimulant expectorant in—

Chronic Bronchitis, and Bronchorrhœa, the Chloride is of great service.

Pneumonia, at the crisis, the Carbonate, in infusion of Senega, liquefies the products of inflammation, and counteracts the adynamia.

Neuralgias, as ovarian and migraine, also in nervous headache,—the Chloride, in 30-grain dose, with gtt. ij–v Tinct. Aconiti, to relieve pain;—or Raspail's Eau Sédatif applied locally.

Exanthemata, especially variola, scarlatina and erysipelas, when feeble circulation, cyanosis and delirium,—the Carbonate in a solution of the Acetate or the Liquor Ammonii Acetatis.

Catarrhs, gastric, duodenal and intestinal,—the Chloride of Ammonium has a high reputation.

Hepatic Disorders, as incipient cirrhosis, chronic torpor, catarrh of the bile ducts and its jaundice, bilious conditions, etc.,—the Chloride with fluid extract of Taraxacum.

Acidity and Vomiting,—the Carbonate in a solution of the Acetate.

Hysteria,—the Valerianate and the Aromatic Spirit are much used.

Fevers,—the Carbonate as a stimulant, the Acetate as a febrifuge.

Poisoned Bites and Stings are treated locally with Aqua Ammoniae.

Inflammations,—the Chloride in Alcohol and Water, as a lotion.

As a Cardiac Stimulant in syncope, thrombosis, hemorrhage, chloroform narcosis, snake-bites and hydrocyanic acid poisoning,—the Spirit inhaled or the Aqua diluted intravenously; acts by relaxing inhibition.

ANTIMONIUM,—Antimony.**Preparations.**

Antimonii et Potassii Tartras, Tartar Emetic, gr. $\frac{1}{8}$ – $\frac{1}{4}$; after tolerance as high as gr. ij may be given.

Vinum Antimonii, $\mathfrak{m}\nu$ – \mathfrak{z} ij; has 2 grains of Tartar Emetic to the \mathfrak{z} .

Syrupus Scillæ Compositus, Compound Syrup of Squill, Cox's Hive Mixture, $\mathfrak{m}\nu$ – \mathfrak{z} j; contains about $\frac{3}{4}$ grain Tartar Emetic to the \mathfrak{z} , with Squill, Senega, Calcium Phosphate, Diluted Alcohol, Sugar, and Water.

Pulvis Antimonialis, James' Powder; gr. iij–viii;—is one-third Oxide of Antimony, with two-thirds Calcium Phosphate.

Treatment of Poisoning by Tartar Emetic. Administer Tannic Acid, in some form, as an antidote; then Opium as an antagonist, and demulcent drinks to protect the mucous membrane.

Physiological Actions of Tartar Emetic. It is a systemic and local emetic, a diaphoretic, an arterial sedative, and a gastro-intestinal irritant; has a styptic taste, and causes constriction of the fauces. As an emetic, it is too depressant for use. It promotes waste and the rapid excretion of waste products.

In small doses, it stimulates the secretions of the stomach and intestinal canal, the salivary glands, liver and pancreas. *In larger doses*, it produces vomiting and purging, with evacuations much like the "rice water discharges" of cholera, and great prostration of the vital powers. *Toxic doses* produce similar symptoms, with epigastric pain, cyanosis, delirium, motor and sensory paralysis, suppression of urine, collapse,—much the phenomena of Asiatic Cholera. It is paralyzant to the heart-muscle, combines with the red blood corpuscles, depressing their oxidizing power, lowering the blood pressure, and reducing the temperature. Being eliminated by all the excretory organs, including the skin, it excites follicular inflammation therein, resulting in a papular eruption on the integument, which becomes vesicular and pustular, the pustules being umbilicated, like those of variola. This may be produced by rubbing it into the skin.

Therapeutics. The use of Tartar Emetic was formerly greatly abused, and it has now gone out of fashion. It is, however, useful in—

Acute Cold and Bronchitis,—gr. $\frac{1}{8}$ with gr. $\frac{1}{8}$ of Morphine, is excellent.

Asthma and Emphysema, with lack of secretion, are much relieved by gr. $\frac{1}{8}$, to relax spasm and promote secretion.

As a Hypnotic in the active delirium and restlessness of fevers, especially typhoid,—Tartar Emetic gr. $\frac{1}{8}$, with gr. $\frac{1}{4}$ of Morphine, is serviceable.

Wheezing of young children, with dyspnœa and cough, simulating asthma, may be stopped by gr. j of Tartar Emetic in $O\frac{1}{2}$ Water, teaspoonful doses.

VEGETABLE ACIDS.

Vegetable Acids used in Medicine, and their doses.

Acidum Aceticum Dilutum, \mathfrak{z} j-ij, used locally.

**Acetum*, Vinegar, an impure dilute acetic acid.

Acidum Citricum, used as **Succus Limonis*, Lemon-juice, \mathfrak{z} j-ij.

Acidum Tartaricum, gr. x-xx. 100 grains saturate $133\frac{1}{2}$ grs. of Potassium Bicarbonate. *Pulvis Effervescens Comp.*, see page 35.

Physiological Action. In concentrated form they have escharotic powers, and produce gastro-enteritis if swallowed. In dilute form they diminish thirst and allay restlessness. They form salts in the stomach, thus enter the blood, and are there oxidized, producing carbonic acid, which increases the acidity of the urine. They increase secretion, and the water of the urine. Long continued they cause emaciation and poverty of the blood, in fact, a general scorbutic condition. Tartaric Acid has been fatal in a dose of \mathfrak{z} j. Acetic has caused death once. Citric seems to be non-toxic in man.

Therapeutics. Tartaric Acid is rarely used except in the effervescing powders, Citric being preferred. The latter is used in—

Scurvy, as a prophylactic and a curative agent, in form of Lemon juice.

Acute Rheumatism,—Lemon juice freely, used \mathfrak{z} j-ij 4 or 5 times a day.

Fevers,—Lemonade to be used freely, as a refreshing and refrigerant drink.

Inflammations,—Dilute Acetic Acid in superficial inflammations of the skin.

Skin Affections, as warts, vegetations, pityriasis, etc.,—Glacial Acetic Acid is used as a caustic.

Obesity,—Lemon juice to correct fatness, by impairing digestion.

Atheromatous Degeneration may be retarded by the daily use of Lemon juice, which dissolves the excess of inorganic matter, and permits of its excretion.

SULPHUR, SULPHITES, SULPHIDES.

Preparations.

Sulphur Lotum, Washed Sulphur, \mathfrak{z} j-ij, in syrup, as a laxative.

Acidum Sulphurosum, Sulphurous Acid, m-v- \mathfrak{z} j. A colorless liquid containing about 3.5 per cent. of Sulphurous Acid Gas, and about 96.5 per cent. of Water.

Sodii Sulphis, Sulphite of Sodium, gr. v–xx. *Sodii Hyposulphis*, gr. v–xx. *Potassii Sulphis*, gr. iij–x. **Potassii Sulphidum*, Sulphide of P. gr. j–v. *Calx Sulphurata*, Sulphurated Lime, commonly misnamed Sulphide of Calcium, gr. $\frac{1}{10}$ –ij. A grayish white powder, of foul odor, and very insoluble.

Physiological Actions. *Sulphur* is a very mild laxative. It is dissolved by alkaline solutions and oils, hence is absorbed from the small intestine, entering the blood, and discoloring silver coins carried by those using it, by forming a sulphide of silver. *Sulphurous Acid* has great affinity for oxygen, and is a powerful disinfectant and deodorizer, and destructive to all low life. Its gas inhaled is irritant to the glottis, causing inflammation of the passages. *The Sulphites and Hyposulphites* are partly decomposed by the acid of the stomach, sulphurous acid being given off, and the balance being converted into sulphates and absorbed, undergoing elimination as sulphates by the kidneys. *The Sulphides* also are partly converted into sulphates. They are irritant to the stomach, etc., extremely nauseous in taste and smell, increase the secretion of the intestinal glands, and are laxative. If administered for some time they impair the blood, and cause emaciation, anæmia, trembling and great debility.

Therapeutics. *Sulphur* is used as a laxative when the stools need softening on account of hemorrhoids and fissure, etc. In—

Chronic Rheumatism and Sciatica—Sulphur has some repute.

Scabies,—Sulphur locally as a parasiticide; or a solution of the Sulphide of Potassium in water, ℞s ad ℥j, as a bath or wash.

Chronic Bronchitis, with bronchorrhœa,—Sulphurous acid as spray.

Acidity, Pyrosis, and Acid Indigestion,—Sulphurous acid, ℥v, diluted.

Chilblains,—Sulphurous acid with Glycerin, is a good application.

Gangrenous Wounds,—Sulphurous acid the best antiseptic application.

Constipation,—the Blue Lick Water, Oj before breakfast; or the Sulphides.

Lead Poisoning,—Sulphur baths to favor the elimination of the metal.

Suppuration, may be prevented or limited by the Sulphide of Calcium in small doses (gr. $\frac{1}{10}$) every hour. Extremely efficient in crops of boils, scrofulous sores, glandular enlargements, acne, and even in extensive suppurating surfaces.

Skin Diseases, especially chronic psoriasis and eczema, also in pityriasis and prurigo;—Sulphur baths (*see Scabies* above), are very useful.

IODINE, IODIDES.

Preparations.

Iodum, Iodine, gr. ss-gr. j. Soluble in Alcohol (1 in 12), Ether, and Water (1 in 7000). *Amylum Iodatum*, Iodized Starch, ℥j-℥j.

Iodoformum, Iodoform, gr. j-gr. v, but chiefly used locally. To remove its odor, use *Thymol* (gtt. ij ad ℥j) or *Balsamum Peruvianum*, or still better, Nitro-benzol or Oil of Mirbane, 6 drops to each 15 grains of Iodoform, or Oil of Bitter Almonds, or Oil (Attar) of Rose.

Liquor Iodi Compositus, Lugol's solution, ℥j-x, diluted. *Iodum*, 5, *Potassii Iodidum* 10, *Aqua* 85.

Tinctura Iodi, ℥j-v. *Unguentum Iodi*, = *Iod.*, *Pot. Iod.*, *Adeps*, *Aqua*. *Ammonii Iodidum*, gr. v-xx. *Potassii Iodidum*, gr. v-℥j.

Sodii Iodidum, gr. x-℥ij. *Ung. Potassii Iodidi*, for local use.

**Iodo-tannin*. Tannin dissolved in *Tinctura Iodi*. For local use.

Antidote to free Iodine is Starch, to form the Iodide of Starch, which should then be evacuated from the stomach.

Physiological Actions. *Iodine* is irritant, also vesicant if used in quantity, staining the skin yellow. Combining with the hydrogen of phosphuretted and sulphuretted gases it is a disinfectant and deodorant. *The Iodides* are very diffusible and rapidly excreted; setting free ozone and iodine at the points of elimination, they are irritant, setting up violent coryza, with soreness of the throat and eyes, headache and profuse mucous discharge, with irritation of the kidneys. They induce great waste and rapid elimination of waste products, causing anæmia, emaciation, and depression, if used for any length of time. They combine with foreign substances in the system and remove them. *Iodism* comprises the foregoing symptoms, together with frontal headache, a saline taste in the mouth, dysphagia, eruption of acne on the face and limbs, and temporary impotence. Sometimes the eruption is furuncular or even purpuric. Copious dilution of these salts with water promotes their excretion, and prevents these results to a great extent.

Therapeutics of Iodine. The tincture is much used as a counter-irritant, and an alterative injection. Iodoform and Iodo-tannin are chiefly employed as antiseptic and alterative applications in local diseases.

Catarrh and Hay Fever,—inhalations of Iodine or the Carbolate.

Inflammations,—Tincture of Iodine locally, to promote absorption.

Chronic, Splenic and Hepatic Disorders,—Tincture or Ointment locally.

Skin Diseases,—the Glycerite or Tincture, in chloasma, lentigo, lupus.

Glandular Tumors, hypertrophied tonsils, cervical cysts, etc.,—Tincture of Iodine parenchymatously injected.

Empyema, Hydrocele, Ovarian Cysts, etc.,—the Tincture injected undiluted, is one of the best applications.

Sores, Ulcers, Fissures, etc.,—Iodoform, Iodo-tannin, or the Iodide of Starch, are highly recommended.

Vomiting of Pregnancy,—drop doses of the tincture every hour.

Therapeutics of the Iodides. They are especially used in—*Acute Catarrh and Hay Fever*,—Potassium Iodide with Arsenic internally, Iodine and Carbolic Acid in weak solution locally.

Chronic and Capillary Bronchitis,—the Ammonium Iodide, in small doses rapidly administered, is remarkably efficacious.

Catarrhal Pneumonia,—the Ammonium Iodide, to prevent caseation of the products. Arsenic may well be combined with it.

Spasmodic Asthma,—Potassium Iodide, in 15 to 30-gr. doses, is often very efficient, especially when due to bronchial catarrh.

Hepatic Cirrhosis, in the first stage,—Ammonium Iodide with Arsenic.

Duodenal Catarrh, and jaundice therefrom,—Ammonium Iodide.

Aneurisms,—Potass. Iod. in large doses (gr. xv–xxx) is often curative.

Tertiary Syphilis, and many of its results, as neuralgiæ, paralysees from gummata, syphilitic ulcerations, syphiloma of the internal viscera, chronic rheumatism and sciatica of syphilitic origin, lupus of syphilitic or scrofulous origin—are all best treated by Iodide of Potassium.

Mercurial Poisoning, and other chronic metallic toxæmiæ,—Pot. Iod.

Malaria,—the Ammon. Iod. with Arsenic in chronic malarial poisoning.

Tonsillitis, and simple sore throat,—a weak solution of Potass. Iodide.

Chronic Bright's Disease,—the prolonged use of Potassium Iodide has seemed to retard the changes.

HYDRARGYRUM,—Mercury.

Preparations.

Hydrargyrum cum Creta, Mercury with Chalk, Gray Powder, gr. ss–x.

Massa Hydrargyri, Blue pill, gr. ss–xv. Each grain contains gr. $\frac{1}{3}$ of Mercury, with Liquorice, Althæa, Glycerin and Honey of Rose.

Unguentum Hydrargyri, Blue Ointment,—Mercury, Lard, Suet, etc.

Hydrargyri Chloridum Corrosivum, Bichloride, Mercuric Chloride, Corrosive Sublimate, gr. $\frac{1}{80}$ – $\frac{1}{10}$. Soluble in 16 parts of water.

Hydrargyri Chloridum Mite, Mild Chloride, Subchloride, Mercurous Chloride, Calomel, gr. $\frac{1}{10}$ –gr. x. Insoluble in water or alcohol.

Hydrargyri Subsulphas Flavus, Yellow Subsulphate, Turpeth Mineral, gr. ij-v, as an emetic. Insoluble in water or alcohol.

Hydrargyri Oxidum Flavum, Yellow Oxide, gr. $\frac{5}{10}$ - $\frac{1}{10}$. *Unguentum Hydrargyri Oxidi Flavi* has strength of $\frac{1}{10}$. *Oleatum Hydrargyri*, Oleate of Mercury. Yellow Oxide of Mercury (1) in Oleic Acid (9).

Hydrargyri Oxidum Rubrum, Red Precipitate. *Unguentum Hydrargyri Oxidi Rubri*, has strength of $\frac{1}{10}$.

Hydrargyri Iodidum Viride, Green Iodide, Protiodide, gr. $\frac{1}{10}$ - $\frac{1}{3}$.

Hydrargyri Iodidum Rubri, Red Iodide, Biniodide, gr. $\frac{3}{10}$ - $\frac{1}{10}$.

Hydrargyri Cyanidum, Cyanide of Mercury, gr. $\frac{1}{100}$ - $\frac{1}{10}$.

Unguentum Hydrargyri Nitratis, Citrine Ointment. Mercury 7, Nitric Acid 17, Lard Oil 76. **Unguentum Hydrargyri Nitratis Rubrum*, Brown Citrine Ointment. Made with Ol. Morrhuae.

Pilule Antimonii Compositæ, Plummer's pills. Each pill contains Sulphurated Antimony, Calomel, āā gr. $\frac{1}{2}$, Guaiac gr. j.

**Black Wash*, Calomel, ʒj, Lime-water Oj, producing the Black Oxide of Mercury. **Yellow Wash*, Corrosive Sublimate ʒss, Lime-water Oj, producing the Yellow Oxide of Mercury.

Incompatibility of the Chlorides of Mercury. They are incompatible with almost everything. Corrosive Sublimate is easily decomposed, and the combination of Calomel with Muriatic Acid or Chlorides is apt to produce Corrosive Sublimate.

Antidote to the Mercurial Salts. Albumen,—the white of one egg to 4 grains of Corrosive Sublimate, an excess redissolving it. Prompt emesis is also necessary, after giving albumen. •

Physiological Actions. Mercury is easily absorbed in any form; is excreted by the liver (in which it tends to accumulate while stimulating its cells), also by the intestinal and salivary glands, the kidneys, and partly by the skin. It has a selective action on the glands, especially the salivary and the pancreas, which it also stimulates to the production of pathological secretions.

In Small Doses, Mercurial salts are blood tonics, increasing the number of the red corpuscles. They promote waste by stimulating the lymphatic system, and in very small doses are sedative to the mucous membranes.

In Medium Doses, they have a selective cathartic action, and increase the flow of bile by reflex action on the bile ducts, as do resinous purgatives.

In Full Doses, continued, they over-stimulate the glands, especially the pancreas, producing pathological secretions, impair the ozonizing function

of the blood, diminishing the red corpuscles, and produce a low inflammation in the nervous tissue, resulting in loss of coördination power.

Corrosive Sublimate, in small doses, prevents hyperplasia of the connective tissue, and causes, in large doses, inflammation and ulceration of the lower bowel. It is a powerful gastro-intestinal irritant, and poisonous also to the cardiac muscle. It is an effective parasiticide, and the most efficient of all the antiseptics.

Calomel is very insoluble, and unirritating. It is tasteless, laxative in grain doses, and acts especially on the excrementitious intestinal glands.

The *Red Iodide* and the *Cyanide* are irritant poisons. The *Acid Nitrate* is a good escharotic, its pain being severe but transient.

Salivation (ptyalism) is produced most readily by Blue Mass, next by Calomel, and least so by Mercury with Chalk. Its first symptoms are sore teeth, spongy gums, profuse saliva, fetid breath, bluish line along margins of the teeth; then swelling of the glands, aching jaws and muscles, and fever, resulting in emaciation, marked anæmia, falling of the hair, ulcerated skin, fetid diarrhœa, trembling, obscure nervous phenomena, albuminuria, and in women abortion, through impoverished blood.

Therapeutics. Mercury is undoubtedly a specific in—

Syphilis, in which it is best given in small doses to just short of ptyalism, then stopped, but renewed, and so continued for some time. The Green Iodide in small doses (gr. $\frac{1}{10}$ — $\frac{1}{8}$ ter die) with Opium, the best for internal administration. It is not applicable to the tertiary form; therein Potassium Iodide is the remedy.

Tonsillitis, *Parotitis*, and other acute glandular inflammations may often be cured rapidly by Calomel, gr. $\frac{1}{20}$, or Gray Powder, gr. $\frac{1}{3}$, every two hours.

Irritable Stomach, vomiting, etc., Calomel in small doses, gr. $\frac{1}{20}$ — $\frac{1}{10}$.

Gastric Ulcer,—Corrosive Sublimate, gr. $\frac{1}{80}$ — $\frac{1}{30}$, ter die, is effective.

Ileo-colitis of Infants,—gr. $\frac{1}{2}$ of Gray Powder, or Calomel, gr. $\frac{1}{20}$ — $\frac{1}{12}$.

Dysentery of Adults, stools slimy and bloody,—Corrosive Sublimate, gr. $\frac{1}{100}$.

Diphtheria,—Calomel in large doses, or the Cyanide, in doses of gr. $\frac{1}{100}$ — $\frac{1}{50}$, have many advocates.

Membranous Laryngitis,—the Subsulphate (gr. iij—v) as emetic.

Typhoid Fever,—Calomel, a 10-grain dose each day for three days, is antipyretic. This is the German specific typhoid treatment.

Hepatic Cirrhosis,—Corros. Sublim., gr. $\frac{1}{30}$ ter die, in the first stage.

Skin Diseases, as psoriasis, herpes, pruritus, acne, pityriasis, etc.,—ointments of Calomel, Corrosive Sublimate, and the Iodides.

Parasitic Skin Diseases,—Corrosive Sublimate lotions, gr. ij ad \mathfrak{z} j; or a five per cent. solution of the Oleate with $\frac{1}{8}$ part of Ether.

Conjunctivitis,—Oint. of the Yellow Oxide, or Brown Citrine Ointment.

Goitre, Enlarged Spleen,—Oint. of Red Iodide, rubbed in with heat.

Antiseptic Solution,—Corros. Sublim. gr. vijss to a quart of hot water, makes a sol. of 1 in 2000.

AURUM,—Gold.

Preparations.

Auri et Sodii Chloridum, gr. $\frac{1}{30}$ — $\frac{1}{15}$ in pill. Is in fact a subchloride.

**Auri Chloridum*, Chloride of Gold, gr. $\frac{1}{60}$ — $\frac{1}{30}$. Best given in solution.

Physiological Actions. They resemble the effects of Mercury closely. *In Small Doses*, the Salts of Gold promote appetite and digestion, stimulate the cerebral functions, and produce a marked mental exhilaration, a sense of well-being. Continued, they induce aphrodisiac effects in both sexes, and in women an increase of the menstrual discharge. *Full Doses* cause nausea and vomiting, glandular irritation, salivation without loosened teeth or sore gums, increased urine, sweats, and fever (the auric fever); nutrition is impaired, and rapid waste set up. *Toxic Doses* produce effects similar to those from Corrosive Sublimate, violent gastro-enteritis, mental disturbance, convulsions, priapism, trembling, paralysis.

Poisoning by the Chloride of Gold is treated by *Albumen* or flour, and evacuation of the stomach, just as in the case of Hydrarg. Chlor. Corr.

Therapeutics. The Salts of Gold are useful in—

Irritative Dyspepsia, with red glazed tongue, epigastric pain, diarrhœa.

Gastro-duodenal Catarrh is much benefited by very small doses.

Hepatic and Renal Sclerosis, and especially in the chronic fibroid kidney, the salts of Gold in small doses are extremely valuable, if given in the incipency, as they prevent hyperplasia of connective tissue.

Hypochondriasis, is best treated by the auric preparations in small doses.

Amenorrhœa, and Impotence, of the functional kind, may be cured by it.

Syphilis, especially its tertiary ulcerations, and syphiloma of bones, etc., after other ineffectual treatment, try the Chloride of Gold.

COLCHICUM,—Meadow Saffron.

Source and Composition. The corms and seeds of *Colchicum autumnale*. It contains an alkaloid, *Colchicine* (converted into *Colchiceïn* by acids), Tannic and Gallic Acids, Starch, Sugar, and a Resin.

Preparations. Those of the seeds are the best.

Vinum Colchici Seminis, ℥v—xx. *Vinum Colchici Radicis*, ℥x—xxx.

Extr. Colchici Sem. Fl., ℥j-v. *Extr. Colchici Rad. Fl.*, ℥v-xx.
Tinctura Colchici Seminis, ℥v-xx. *Colchicina*, gr. $\frac{1\frac{1}{2}}{20}-\frac{1}{60}$.

Physiological Actions. Colchicum is a drastic purgative, emetic, diuretic, diaphoretic, gastro-intestinal irritant, and a cardiac depressant. Its taste is bitter and acrid. *In Small Doses* it increases secretion, especially the urine and the perspiration. *In Full Doses* its action is emeto-cathartic, producing profuse watery discharges, great nausea, and muscular feebleness. *In Large Doses* it is a powerful gastro-intestinal irritant, causing griping, choleraic discharges, lowered arterial tension, and depression of the heart by reflex action over the distribution of the pneumogastric. Then great prostration, convulsions and collapse, death from exhaustion, with consciousness preserved until carbonic acid narcosis sets in. On the excretion of uric acid and urea its influence is a greatly disputed question; but it probably increases the flow of bile.

Treatment of Colchicum Poisoning. Emesis and catharsis. Warm drinks freely. Tannic Acid as an antidote. Morphine hypodermically, to sustain the heart.

Therapeutics. Colchicum is a specific palliative in—

Acute Gout, in which it should be given with an alkali, and kept short of emeto-catharsis. It does not prevent relapses, and its power is weakened by repetition, in this disorder. The alkaloid is probably the most effective preparation in this disease.

Ascites, due to obstructive disease of the liver,—Colchicum in full doses, with Opium to sustain the heart, is most effective, from the profuse drain which it establishes.

Portal Congestions are relieved by Colchicum with a saline purgative, as it markedly depletes the portal circulation.

Cerebral Congestion of acute type,—Colchicum as a revulsive purgative.

Acute Rheumatism,—Colchicum is often very efficient, but frequently fails, and at any rate should not be long administered in this affection.

GUAIAIACUM,—Lignum Vitæ.

Source and Composition. It is the heart wood of *Guaiacum officinale*, a West India tree; and contains 60-70 per cent. of *Resin* (*Guaiaci Resina*) which consists of 3 Acids, *Guaiaconic*, *Guaiarec*, *Guaiacic*; also 4 Sub-resins, and a yellow Coloring-matter.

Preparations.

Guaiaci Resina, Resin of Guaiac, gr. v-xx, in wafer.

Tinctura Guaiaci, ℥x-℥j. *Tinct. Guaiaci Ammoniata*, ℥v-℥ss.

Physiological Actions. Guaiac is diaphoretic, expectorant and alterative. Its taste is acrid and very disagreeable. It irritates the gastric mucous membrane, increasing its mucus, salivates by reflex action, and stimulates the intestinal secretions and the flow of bile. Though a colloidal body it enters the blood, producing diaphoresis, and stimulating the excretory glands and the production of bronchial mucus. Its continued use produces gastric catarrh, and in large doses it causes vomiting, purging and severe congestive headache.

Therapeutics. It is a valuable remedy in—

Tonsillitis, to abort the attack,— \mathfrak{z} ss of Tincture every 4 hours.

Neuralgic Dysmenorrhœa,—Guaiac is promptly alleviative.

Chronic Rheumatism,—in which it has an established reputation.

Syphilis,—it has been well used in the form of the Compound Decoction of Sarsaparilla, of which Guaiac is an ingredient.

STILLINGIA,—Queen's Root.

Source and Composition. It is the root of *Stillingia sylvatica*; and contains a Resin and a Volatile Oil. Its active principle has not yet been isolated.

Preparations. They should be made from the fresh root, as those from the dried root are almost inactive.

Extractum Stillingiæ Fluidum, \mathfrak{m}_x — \mathfrak{z} j. **Tinctura Stillingiæ*, \mathfrak{z} ss—ij.

Physiological Actions. *Stillingia* is expectorant, diaphoretic, diuretic, purgative, cholagogue, sialogogue and alterative. Its taste is acrid and pungent. It increases the action of the heart, skin, kidneys, and bronchial mucous membrane; and the gastric, hepatic, intestinal and salivary secretions. Full doses excite epigastric pain, nausea and vomiting.

Therapeutics. It is considered valuable in—

Strumous and Syphilitic Affections,—as an alterative.

Ascites from hepatic changes,—it rapidly removes the fluids.

Portal Congestions of malarial origin, torpid liver, and jaundice.

Constipation due to deficient intestinal secretion,—it is very useful.

Hemorrhoids due to hepatic obstruction, or to chronic constipation.

Intermittents,—the Fluid Extract with Quinine or Arsenic is a very useful combination. A strong decoction is said to ward off an impending paroxysm of ague.

SANGUINARIA,—Blood-root.

Source and Composition. It is the rhizome of *Sanguinaria Canadensis*, and contain 3 alkaloids,—*Sanguinarine* (identical with *Chelethrythrine*, from *Chelidonium Majus*), *Porphyroxine* and *Puccine*,—combined with *Chelidonic* and *Sanguinarinic Acids*; also a Resin, Gum, Albumen, Sugar, etc. The salts of its alkaloids are of brilliant red and orange colors, and are all soluble in water.

Preparations.

Tinctura Sanguinariae, $\mathfrak{M}_{\text{V-XX}}$; as an emetic, $\mathfrak{Z}_{\text{j-ij}}$.

Extr. Sanguinariae Fluidum, $\mathfrak{M}_{\text{V-XXX}}$. *Acetum Sanguinariae*, $\mathfrak{M}_{\text{V-XXX}}$.

**Sanguinarina*, *Sanguinarine*, gr. $\frac{1}{2}$ — $\frac{1}{8}$. Gr. v is an emetic dose.

Physiological Actions. *Sanguinaria* is sternutatory, sialogogue, emetic (systemic), expectorant, emmenagogue, a cardiac paralyzer, a violent irritant, an acro-narcotic, and an alterative.

Its taste is bitter and acrid. It causes violent sneezing, increases secretion by irritating the secretory organs as it is eliminated, and produces salivation, catharsis, and emesis with great depression. Full doses are violently irritant, the heart's action being first increased, then depressed, and finally paralyzed by stimulation of its inhibition. It decreases the reflexes by paralysis of the spinal centres, causes dilatation of the pupils, lowered temperature, cold sweats, great thirst, collapse, and death by paralysis of the cardiac and respiratory centres, frequently preceded by convulsions. Locally it is a feeble escharotic.

Therapeutics. *Sanguinaria* is well employed in—

Chronic Nasal Catarrh,—gtt. x of tinct. ter die, also powder locally.

Acute Bronchitis and Asthma,—as an expectorant, with *Lobelia*, etc.

Chronic Bronchitis,—*Sanguinaria* is a most serviceable remedy.

Catarrhs of the duodenum and biliary ducts,—it is very useful.

Atonic Dyspepsia, gtt. ij—ijj of the Tincture, or gr. $\frac{1}{2}$ of *Sanguinarine*.

Functional Impotence from irritability,—combined with *Stillingia*.

Amenorrhœa of functional character, in non-plethoric subjects.

Croup,—in which many authorities rank it a specific.

Pneumonia, of typhoid type,—after acute symptoms subside.

Scarlatina,—the decoction as a gargle for the sore throat.

Nasal Polypi, after their removal,—*Sanguinaria* by insufflation.

Hypertrophy of the nasal mucous membrane,—*Sanguinaria* by insufflation.

Ulcers and fungous granulations,—the powdered drug, locally.

Strumous and Syphilitic Affections,—it is a good alterative.

XANTHOXYLUM,—Prickly Ash.

Source and Composition. The bark of *Xanthoxylum fraxineum*. It contains an alkaloid,—*Xanthoxyline* (identical with *Berberine*),—a Volatile and a Fixed Oil, Gum, Resin, etc. Dose, gr. x-xxx.

Preparations.

Extractum Xanthoxyli Fluidum, ℥x-ʒij. **Decoctum Xanthoxyli*, ʒj to the quart. Dose, a pint during 24 hours in divided doses.

Physiological Actions. The taste of *Xanthoxylum* is aromatic, soon becoming acrid and bitter. It is a local and systemic sialogogue, causing profuse salivation, with tingling in the tongue, and increased secretion from stomach, intestines, liver and pancreas. It is also diaphoretic and diuretic, increases the action of the heart, and raises the arterial tension.

Therapeutics. *Xanthoxylum* is efficient in—

Chronic Pharyngitis,—the Fluid Extr., ℥x-xxx, internally, the Decoction locally, as a gargle.

Jaundice from catarrh of the bile ducts,—it is highly serviceable.

Chronic Rheumatism, myalgia, lumbago, etc.,—it has a high reputation.

Constitutional Syphilis is well treated by *Xanthoxylum*.

Toothache,—the root or bark chewed is a popular remedy.

Paralysis of the Tongue is said to be removed by chewing the root.

MEZEREUM,—Mezereon.

Source and Composition. The bark of *Daphne Mezereum*, a European shrub. It contains a glucoside,—*Daphnin*—also a Resin, an acrid Volatile Oil, etc.

Preparations. It is a constituent of the officinal Compound Decoction and Compound Fluid Extract of Sarsaparilla.

Extractum Mezerei Fluidum, ℥v-xxx. *Unguentum Mezerei*, local use.

Physiological Actions. Mezereon is a sialogogue, and, in small doses, laxative and alterative. It is intensely acrid, and an irritant poison, causing violent vomiting, purging, nephritis, and gastro-enteritis.

Therapeutics. It has been used with advantage in—

Chronic Rheumatism.

Toothache.

Strumous and Syphilitic Affections.

Paralysis of the Tongue.

SARSAPARILLA,—Smilax.

Source and Composition. The root of *Smilax officinalis*, a vine growing in Honduras, Brazil, etc. It contains a principle,—*Smilacin*, or *Parallin*,—from which is derived another,—*Parigenin*,—also an Essential Oil, Calcium Oxalate, Starch, Resin, etc.

Preparations. The most important are—

Extractum Sarsaparille Fluidum, ℥ss-℥j.

Decoctum Sarsaparille Compositum, ℥j-iv; contains also Guaiac, Sassafras, Mezereon and Liquorice. Large doses are necessary.

Syrupus Sarsaparille Compositus, ℥j-v; contains also Guaiac, Rose, Senna, Liquorice, Sassafras, Anise and Gaultheria.

Physiological Actions. Negative results have followed the most carefully executed experiments. It probably has no activity, though by some it is considered to be an efficient diaphoretic.

Therapeutics. Formerly held in repute as an alterative, it was much used as a “blood-purifier” in domestic practice, and by surgeons in the scrofulous and syphilitic cachexiæ. Its value is probably due to its being generally used as a warm decoction in large quantities, causing increased elimination of waste products, promoting the renal and cutaneous circulation, and thus producing diaphoresis and diuresis. In—

Chronic Syphilis, it may be well used as an adjuvant to Mercury in the second stage, or as a vehicle for Potassium Iodide in the tertiary form.

The Syrup is the best vehicle to disguise the taste of Potassium Iodide.

TANNIC AND GALLIC ACIDS.**Preparations.**

Acidum Tannicum, Tannic Acid, Gallo-tannic Acid, Tannin; gr. j-x.

Unguentum Acidi Tannici, has 1 part of T. to 9 of Benzoated Lard.

Suppositoria Acidi Tannici, have 1 part of T. to 5 of Cacao butter.

Acidum Gallicum, Gallic Acid, gr. x-xxx. Soluble in 100 of cold water.

Unguentum Acidum Gallici, has 1 part of G. to 9 of Benzoated Lard.

**Glyceritum Acidi Tannici*, contains 1 part of Tannin to 4 of Glycerin.

**Glyceritum Acidi Gallici*, contains 1 part of Gallic Acid to 4 of Glycerin.

Difference between Tannic Acid and Gallic Acid. According to some authorities the difference is one of oxidation; Tannic Acid, when oxidized, being converted into Gallic Acid. According to others Tannic Acid is simply Gallic Acid Anhydride, and the difference is one of hydration.

How are they procured? Tannic Acid is obtained from the galls of the Dyer's Oak, (*Quercus lusitanica*), by treatment with Ether. Gallic Acid is obtained from the same galls, after exposure in a warm place for a month; or from Tannic Acid by the action of dilute Sulphuric Acid. Tannic Acid is converted into Gallic in the stomach before absorption.

Principal Vegetable Astringents, all contain some form of Tannic Acid, on which their physiological and therapeutical properties depend. They are as follows, viz.—

Galla, Nut-gall.—The gall of *Quercus lusitanica*. Composition, Tannic Acid 60–70 per cent., Gallic Acid 3 per cent., Ellagic Acid, Pectin, Sugar, Starch, etc. *Tinctura Gallæ*, ℥ss–ij. *Unguentum Gallæ*.

Hæmatoxylon, Logwood. Contains Tannic Acid, Hæmatoxylon, etc. *Extractum Hæmatoxyli*, gr. v–xx. **Decoctum Hæmatoxyli*, ℥j–ij.

Krameria, Rhatany,—The root of *Krameria triandra*. Contains Rhatania-tannic Acid, Rhatanine, wax, gum, etc.

Tinctura Krameriaë, ℥v–℥ss. *Extr. Krameriaë Fluidum*, ℥v–℥ss. *Trochisci Krameriaë*, j–iij. *Syrupus Krameriaë*, ℥j–iv.

Hamamelis, Witch-hazel,—The leaves of *Hamamelis virginica*. Contains Tannic Acid, 8 per cent., a bitter principle, etc.

Extractum Hamamelidis Fluidum, ℥ij–℥j.

**Pond's Extract*, a proprietary, aqueous preparation, of uncertain composition and strength.

Quercus Alba, White-oak Bark. Contains Quercitannic Acid, Quercin, etc., but no Gallic Acid. No official preparations.

Catechu,—An extract from the wood of *Acacia catechu*. Contains Catechutannic and Catechuic Acids.

Tinctura Catechu Composita, ℥x–℥j. *Trochisci Catechu*, j–iij.

Kino,—The juice of *Pterocarpus Marsupium*. Contains Kino-tannic Acid, Kinoin, etc.

Tinctura Kino, ℥x–℥ij. **Pulvis Kino Compositus*, gr. v–xx.

Geranium, Cranesbill,—The rhizome of *Geranium maculatum*. Contains Tannic and Gallic Acids, and possesses a rather pleasant taste.

Extractum Geranii Fluidum, ℥v–℥j.

Rosa Centifolia, Pale Rose,—The petals of *Rosa centifolia*, the cabbage rose. Contains Tannic Acid, a volatile oil, etc.

Aqua Rosæ. *Unguentum Aquæ Rosæ*.

Rosa Gallica, Red Rose,—The petals of *Rosa gallica*. Contains Tannic and Gallic Acids, the volatile oil, Quercitrin, etc.

Extr. Rosæ Fluidum, ℥v-℥j.

Syrupus Rosæ.

Confectio Rosæ.

Mel Rosæ.

Rubus, Black-berry,—The bark of the root of *Rubus villosus*, and other varieties of *Rubus*. Contains Tannic Acid, 10 per cent., etc.

Extractum Rubi Fluidum, ℥x-℥j. *Syrupus Rubi*, ℥j-℥j.

Castanea, Chestnut,—The leaves of *Castanea vesca*. Contains Tannic and Gallic Acids.

Extractum Castaneæ Fluidum, ℥ss-ij.

Granatum, Pomegranate,—The bark of the root of *Punica Granatum*. Contains Punico-tannic Acid in large quantity; also Tannic Acid, Mannite, and the alkaloid Pelletierine, which is used as a tæniacuge. No official preparations.

**Extractum Granati Fluidum*, ℥ss-jss. **Decoctum Granati*, ℥ij-iv.

***Statice**, Marsh Rosemary,—Root of *Statice limonium*. Tannic Acid.

***Alnus**, Alder,—Bark of *Alnus serrulata*. Tannic Acid, Oil, Resin, etc.

***Heuchera**, Alum-root,—*Heuchera Americana*. Tannic Acid.

***Nymphæa**, Water-lily,—Root of *Nymphæa Odorata*. Tannic and Gallic Acids, etc. **Decoctum Nymphææ*, ℥ss-j.

***Diospyros**, Persimmon,—Fruit of *Diospyros virginiana*. Tannic Acid.

Physiological Actions. *Tannic Acid* is a more powerful astringent than Gallic Acid. It precipitates pepsin and coagulates albumen, impairs digestion, stops peristalsis, and causes constipation. It enters the blood as Gallic and Pyro-gallic Acids, being converted into these by the organism. It is a crystalloidal body, but combines with colloids; and is a valuable antidote in poisoning by the alkaloids and Tartar Emetic, with which it forms nearly insoluble tannates. Its continued use disorders digestion, irritates the mucous membranes, and produces emaciation. Injected into the veins it causes death by the formation of emboli.

Gallic Acid is a much less powerful astringent, and does not coagulate albumen or gelatin.

Hamatoxylon is a mild astringent, of sweetish taste, producing blood-red stools and urine. It does not constipate nor disorder the bowels, but has caused phlebitis.

Hamamelis seems to have special power in restraining venous hemorrhages, a property not wholly due to its Tannic Acid. In large doses it causes severe throbbing pain in the head.

Therapeutics. Tannic Acid is best used locally, and for astringent effect on the intestinal canal; Gallic Acid systemically, and for action on remote parts. In—

Hemorrhoids, and hemorrhages from the lower bowel,—Tannic Acid locally and internally; or Hamamelis as an injection.

Hematemesis, not due to inflammation,—Tannic Acid, gr. x-xx in solution.

Hematuria, and distant passive hemorrhages,—Hamamelis or Gallic Acid internally, are very efficient.

Epistaxis,—Hamamelis has long been employed successfully.

Albuminuria,—Gallic Acid, to restrain the waste of albumen.

Rectal Fissures and Ulcers,—Tannic acid or its glycerite. Rhatany was a favorite with Trousseau in these affections.

Catarrhs, and chronic local affections of the mucous membranes,—Glycerite of Tannin, or better still, Tannic Acid alone, by insufflation.

Gastric Catarrh, Pyrosis, etc.,—Tannic Acid or Kino, internally.

Endocervicitis, Leucorrhœa, etc.,—Tannic Acid with Iodoform.

Conjunctivitis—powdered Tannin after the acute stage has passed. Also excellent in corneal ulcers and granular lids.

Dysentery and Diarrhœas, acute and chronic,—Tannic acid with Opium, or Catechu, internally,—Hæmatoxylin for diarrhœas of children.

Whooping-cough,—Castanea in decoction, taken *ad libitum*.

Skin Diseases, as eczema, impetigo, intertrigo,—the Glycerite of Tannin.

Otorrhœa,—the Glycerite of Tannin is very serviceable in this affection.

Varicose Veins and Ulcers,—Hamamelis is satisfactorily employed.

ARGENTUM,—Silver.

Preparations.

Argenti Oxidum, gr. ss-gr. ij. Is nearly insoluble in water, and is not dangerous as an internal remedy.

Argenti Nitras, gr. $\frac{1}{6}$ – $\frac{1}{2}$, if watched, up to gr. j. Is best given in pill or distilled water; never with Tannin or a vegetable extract, lest an explosive compound result. *Argenti Nitras Fusus*, Melted stick, Lunar Caustic,—for local use. *Argenti Nitras Dilutus*, Mitigated Nitrate of Silver, used locally by ophthalmologists. Is one-half Nitrate of Potassium.

Argenti Cyanidum, used with a mineral acid, to make Hydrocyanic Acid extemporaneously. Has no other medicinal application.

Argenti Iodidum,—Iodide of Silver, gr. $\frac{1}{4}$ –gr. j.

Incompatibles. The Nitrate is exceedingly sensitive to organic matter and light, and decomposes readily. All soluble Chlorides are incompatible with it, precipitating the Chloride of Silver; hence it should be given in distilled water. Most mineral Acids and their salts, Alkalies and their carbonates, Aqua Calcis, and Astringent Infusions are also incompatible.

Antidote to the Silver Salts. Common Salt freely, it precipitating the insoluble chloride of silver, and also acting as an emetic.

Physiological Actions. Nitrate of Silver combines with the albumen of the tissues and is a limited escharotic. It excites superficial inflammation, and stains the part black under the influence of light. The stains may be removed by washing with a strong solution of Potassium Cyanide.

In Small Doses it increases secretion, stimulates the heart, promotes nutrition, and acts as a nerve tonic. *Its Continued Administration* produces gastro-intestinal catarrh, waste of tissue, uræmia, albuminuria, fatty degeneration of the heart, liver and kidneys, hemorrhages, fluidity of the blood, a slate-colored line along the gums, and a similar discoloration of the skin and mucous membranes, with centric impairment of the nervous system, causing paralysis on a large scale, loss of coördination, convulsions, and finally death by paralysis of respiration. These symptoms are collectively termed *Argyria*.

Large Doses produce violent gastro-enteritis, and ulcer of the stomach, from thrombosis of its veins.

Regulation of a course of Silver Medication. The administration of the remedy should be suspended after five or six weeks, and elimination promoted by purgatives, diuretics and baths. To prevent the general discoloration, Potassium Iodide should be given conjointly with the silver, and baths of Sodium Hyposulphite used.

Therapeutics of the Silver Salts. Locally the Nitrate is much used as a stimulant application, an astringent, a caustic, an alterative, and an antiphlogistic. A solution in Nitrous Ether (℥ ij ad ℥ j) will abort—*Superficial Inflammations*, if applied early to the neighboring integument. *Erysipelas*, by Higginbotham's method (℥ iv ad ℥ iv aq. dest.), the solution applied over the inflamed surface and beyond, after careful washing and drying.

Throat Diseases,—the Nitrate is used, but salts of Copper are better.

Ulcers of the tongue and tonsils,—the solid stick may be applied locally.

Dyspepsia, with vomiting of yeasty fluid,—the Nitrate internally.

Chronic Gastritis and Gastric Ulcer,—the oxide in $\frac{1}{2}$ grain doses ter die.

The Nitrate may be combined with Belladonna or Hyoscyamus in chronic gastric catarrh.

Dysentery of chronic type, especially if rectal ulcer,—the Nitrate internally and by enema.

Diarrhœa, of phthisis and typhoid fever,—the Nitrate with Opium.

Conjunctivitis,—solutions of various strengths (gr. j-x ad $\frac{3}{4}$ j of distilled water); when corneal ulcers exist, it must be cautiously used, or opacities and deposits will remain.

Chronic Spinal Inflammations, causing locomotor ataxia or paraplegia,—the Nitrate has in some few cases effected permanent cures.

Epilepsy, was formerly much treated with the Nitrate, which occasionally achieved the most brilliant results.

CUPRUM,—Copper.

Preparations.

Cupri Sulphas, Blue Vitriol, gr. $\frac{1}{16}$ — $\frac{1}{4}$. As emetic, gr. vj, even gr. xij.

Cupri Acetas,—for local use. *Verdigris* is an impure subacetate.

**Cuprum Ammoniatum*, gr. $\frac{1}{8}$ — $\frac{1}{4}$, or more, when tolerance is established.

Treatment of Copper Poisoning. Metallic copper (as a penny), is best let alone; it will pass the anus in due time without serious symptoms. *The Antidotes* to the salts of copper are the Ferro-cyanide of Potassium, and Albumen. Prompt evacuation by emetics or the stomach pump is necessary. Then Potassium Iodide, even to saturation of the system.

Physiological Actions. The Salts of Copper are gastro-intestinal irritants, causing a metallic taste, nausea with vomiting of greenish matters, purging of blood and mucus, constricted fauces, depressed heart action, hurried respiration, fever. Or, as in the case of Arsenic, no gastro-enteritis may occur, but instead profound nervous symptoms, as headache, defective coördination, coma, convulsions.

The symptoms of chronic poisoning are bronchial irritation and catarrh, gastro-intestinal catarrh, colic with diarrhœa [*Lead*, colic with constipation], dysentery, nausea, waste of tissue, anæmia, salivation, and a green line (sulphide) along the margin of the gums in those who do not brush their teeth. The nervous symptoms are also usually well marked. *The Liver* becomes atrophied, from the irritation of its connective tissue, and fatty degeneration of the hepatic cells. *The Lungs* are congested, even pneumonic consolidation being set up; Copper seeming to have a selective affinity for the parenchyma of these organs.

Therapeutics. The Sulphate is the best emetic in—

Narcotic and Phosphorus Poisoning,—gr. xij in \mathfrak{Z} iv of water, a teaspoonful being given every ten minutes until emesis is set up. Also in *Croup*.

Chronic Dysentery and Acute Diarrhœa,—the Sulphate in doses of gr. $\frac{1}{16}$ — $\frac{1}{12}$ with Opium, is the best metallic astringent.

Neuralgia of the 5th, from depression,—Ammoniated Copper valuable.

Gastro-intestinal Catarrh, with diarrhœa,—the Sulphate in small doses.

Pneumonia,—A Tincture of the Acetate is considered curative by Kissel, and was official in the German Pharmacopœia.

Throat Affections, in which weak solutions of the Sulphate are far superior to any other application, even to that of Nitrate of Silver.

Granular Lids and Corneal Ulcers, are best treated by a quick rub with a smooth crystal of Sulphate of Copper, once a day.

Herpes, Eczema, etc.,—ointments or lotions of the Acetate.

Gonorrhœa,—a weak solution of the Sulphate (gr. $\frac{1}{8}$ ad \mathfrak{Z} j) is a good injection after the acute stage has passed.

PLUMBUM,—Lead.

Preparations.

Plumbi Acetas, Sugar of Lead, gr. $\frac{1}{4}$ —v. Soluble in water. \mathfrak{Z} j is toxic.

Plumbi Oxidum, Litharge. *Emplastrum Plumbi*, Litharge and Ol. Olivæ.

Plumbi Carbonas, White-lead paint. An excellent local application.

Liquor Plumbi Subacetatis; Goulard's Extract. Is never used internally.

Liquor Plumbi Subacetatis Dilutus, Lead Water. Contains 3 per cent. of

Liquor Plumbi Subacetatis. Used externally.

Plumbi Nitrates, Nitrate of Lead. Used externally.

Plumbi Iodidum, Iodide of Lead. Used as an ointment.

Treatment of Lead Poisoning. *Acute poisoning*, as by the Acetate,—the Sulphates of Sodium or Magnesium are the antidotes; evacuate stomach, and give albuminous drinks and Opium to allay irritation. *Chronic poisoning* is best treated by Iodides to saturation of the system, the Sodium or Calcium being the best. Sulphurated Potassa baths (\mathfrak{Z} j or more, in water) are also very useful.

Physiological Actions. Astringency is the chief quality of the salts of Lead; they contract muscular tissue, and destroy its contractile power. Lessening secretions they cause colic and constipation. The heart is at first increased in power, but soon slowed, also the respiration. The nervous system is insidiously affected, obscure symptoms, as headache, loss of memory, vertigo, being soon manifested.

Acute Lead Poisoning is rare, the metal itself not being poisonous unless acted on by acids, and the Acetate in large doses being emetic. Intense gastro-intestinal irritation, vomiting, paralysis, coma, collapse, are its principal phenomena.

Chronic Lead Poisoning has its chief sources in *pure* water conveyed by leaden pipes, the use of hair dyes, printing type, etc. Its most prominent symptoms are the blue line (sulphide) along margin of gums, in those who do not clean their teeth, paralysis of the extensor muscles of the forearm (drop-wrist), impaired sensibility, rheumatism without fever or tenderness in the joints,—which, however, are red and swollen,—emaciation, albuminuria, colic, constipation, abortion, gastralgia, aphonia. *Death* may occur from extension of the muscular paresis to the muscles of respiration, from the gradual impairment of nutrition, or from convulsions and coma, a form of the disease known as *Lead Encephalopathy*.

Therapeutics. Chiefly used as an astringent and hemostatic. In—*Skin Diseases*, especially eczema, lichen, impetigo, erythema, etc.,—the Liquor Plumbi Subacetatis, part j to iv of Glycerin and Water.

Catarrhal Discharges of muco-purulent character, from the ear, the vagina and the urethra, especially in gonorrhea and leucorrhœa.

Burns, of small extent, are treated by covering with White-lead paint.

Hemorrhages, as hemoptysis, hematemesis, gastric ulcer, etc., the Acetate in 5-grain doses, every three hours, lowers the heart's action and constricts the local vessels.

Caseous Pneumonia, has been well treated by the Acetate of Lead.

Bronchorrhœa, the Acetate for its astringency, limiting the secretion.

Diarrhœas are commonly treated with the Acetate of Lead; gr. ij with gr. j of pulverized Opium, for choleraic diarrhœa.

Cardiac Hypertrophy,—the Acetate to lower the action of the heart.

Inflammations of external parts are constantly treated by the lotion of “Lead water and Laudanum;” though the constituents are chemically incompatible, it is a valuable sedative and astringent.

ZINCUM,—Zinc.

Preparations.

Zinci Oxidum, gr. ss—gr. x, insoluble in water. *Unguentum Zinci Oxidi*.

Zinci Acetas, Acetate of Zinc, gr. $\frac{1}{10}$ —gr. ij. Is very soluble in water.

Zinci Sulphas, gr. $\frac{1}{10}$ —gr. j. As emetic, gr. vj in \mathfrak{z} iv Aquæ; tablespoonful doses every 5 minutes until emesis occurs.

Zinci Carbonas Præcipitatus, as ointment. **Calamine* is an impure Carbonate of Zinc, formerly a favorite as an ointment.

Zinci Chloridum, is used as a caustic in cancer.

Zinci Valerianas, gr. $\frac{1}{10}$ —gr. ij. *Zinci Phosphidum*,—See PHOSPHORUS.

Physiological Actions. The salts of Zinc are astringents, but milder ones than the salts of Lead. Its soluble salts (the Chloride, Sulphate and Acetate) are corrosive poisons, causing violent gastro-enteritis, and in some cases profound nervous symptoms. *The Chloride* is a powerful and painful escharotic, having great affinity for water, and destroying the albumen of the tissues. *The Sulphate* is a specific emetic, acting promptly and without much depression.

Continued use of these salts produces symptoms similar to those of chronic Lead poisoning, but of less gravity. They do not manifest the same tendency to accumulate in the system as the salts of the other similar metals.

Therapeutics. As weak and mild astringents in—

Gonorrhœa,—injections of the Sulphate (gr. j ad \mathfrak{z} j aquæ) are used.

Conjunctivitis,—the Sulphate, with Morphine and Atropine, as a collyrium.

Skin Diseases,—The Oxide and Acetate, as unguents and lotions.

Lupus, *Epithelioma*, and other malignant growths,—the Chloride as an escharotic, made into a paste with flour and glycerin.

Narcotic Poisoning,—the Sulphate in a 6-grain dose is the best emetic.

Diarrhœas and Dysentery,—the Sulphate with Opium and Ipecac., or the Oxide with Pepsin, are very efficacious.

Summer Diarrhœa of children,—the Oxide with Bismuth and Pepsin is an excellent remedy.

Gastralgia,—the Oxide, gr. v–x, with Aromatic powder and Morphine, is often very efficient.

Night-Sweats of Phthisis,—the Oxide, gr. iij, with Extract. Belladonnæ, gr. ss, at bedtime, is generally effective.

Catarrhs of mucous membranes,—the Sulphate in weak solution locally.

Epilepsy, *Neuralgia*, etc., have been successfully treated by the Oxide and the Valerianate.

*CADMIUM.

Physiological Actions. Cadmium is a close analogue of Zinc, but more powerful. It is an escharotic and astringent, also a very depressant emetic. Its effects are those of an irritant poison, with cerebro spinal symptoms, as coma and convulsions.

Therapeutics. Cadmium is never given internally.

Corneal Opacities are said to be absorbed under the local use of a solution of gr. ij of the Sulphate to \mathfrak{z} j of Distilled Water.

Gonorrhœa is greatly benefited by a mild injection, gr. $\frac{1}{4}$ of the Sulphate to \mathfrak{z} j of Distilled Water.

Enlarged Glands, chronic joint affections, cutaneous diseases, nodes and chilblains,—have been successfully treated with an ointment of the Iodide, i to 8 of Lard.

CERIUM.

Physiological Actions of Cerium. The Oxalate has a slightly metallic taste, is sedative to the stomach, and has a selective sedative action on the *motor* distribution of the pneumogastric nerve. It is an insoluble white powder, and is given in doses of gr. j-x, in pill.

Therapeutics. It was introduced by Sir James Simpson as a remedy for vomiting, especially that of pregnancy. It is useful in—

Reflex Vomiting, 5 to 10-grain doses, in the vomiting of pregnancy, also in the vomiting of phthisis and bronchitis; but large doses must be used for several days.

Cough with Vomiting, is remarkably benefited by this salt.

Gastralgia and Diarrhœa,—it may be used instead of Bismuth.

ALUMEN,—Alum.

An Alum is a double sulphate, formed by the union of the Sulphate of Aluminium, Chromium, Manganese or Ferrum with the Sulphate of an alkaline metal or group (Potassium, Sodium, or Ammonium).

The Official Alum is *Potassic-Aluminic-Sulphate*, or Potassa-alum ($\text{K}_2\text{Al}_2\text{4SO}_4 + 24\text{H}_2\text{O}$), which becomes *Alumen Exsiccatum*, Dried Alum, when the 24 molecules of water are driven off.

Preparations.

Alumen, Alum, Potassa-alum. Soluble in cold water, i to 16, in hot water, i to 3. Dose gr. x-xx,—as an emetic, \mathfrak{z} j for a child.

Alumen Exsiccatum, Dried Alum, $\text{K}_2\text{Al}_2(\text{SO}_4)_4$.

**Aluminii et Ammonii Sulphas*, Ammonia-alum. This alum was official in the U. S. Phar. of 1870.

Physiological Actions. Alum is an astringent, stimulating muscular contraction and coagulating albumen. It first excites the flow of saliva, and then markedly diminishes it. Coagulating pepsin, it arrests digestion, also stops peristalsis, and usually causes constipation, though sometimes inducing diarrhœa. Although coagulating albumen, even in a weak solution, it enters the blood, constricts the capillaries, arrests secretions, especially those of mucous surfaces, and stops capillary hemorrhage.

In teaspoonful doses Alum is an efficient and non-depressant emetic. In large doses it is a gastro-intestinal irritant, $\frac{3}{5}$ of dried Alum having caused the death of an adult in eight hours.

Therapeutics. It is used locally and internally. In—

Gastric Catarrh,—Alum is useful, especially when there is vomiting of glairy mucus. Grs. iv–viij, in pill, ter die.

Gastralgia, *Enteralgia*, and other neuroses, it is often very efficient.

Chronic Catarrhs,—powdered Alum dusted over the surface.

Leucorrhœa, *Gonorrhœa*,—injections of Alum with Zinc Sulphate and Borax, are commonly recommended, and are efficient.

Hemorrhages of passive character, and at distant points, are well treated by Alum in 15-grain doses internally; also locally if possible.

Hemorrhoids,—a crystal of Alum shaped to fit the rectum.

Croup,—Alum is a good emetic, a teaspoonful in syrup every half hour.

Toothache,—Alum in Nitric Ether ($\frac{3}{4}$ ijad $\frac{3}{4}$ vij), locally, is often efficient.

Bed-sores,—Alum 1 part with 2 of Spiritus Camphoræ and the whites of four eggs, is a very efficient application.

Ulcers, *Sores*, etc., when exuberant granulations, burnt Alum as a caustic.

Colliquative Sweats,—an Alum lotion sponged over the skin.

Catarrhal Ophthalmia, after acute stage,—an alum lotion, gr. v to the $\frac{3}{4}$.

Granular Lids,—a crystal of Alum is the very best application.

Lead Colic, and *Constipation*, is most promptly relieved, even cured, by Alum, which acts dynamically, no doubt. It is also a good antidote in Lead-poisoning, being a soluble sulphate.

NUX VOMICA.

Source and Composition. The seeds of *Strychnos Nux-vomica*, an East Indian tree. It contains 3 alkaloids,—*Strychnine*, *Brucine*, and *Igasurine* (?)—which are combined with *Igasuric Acid*. Brucine has only $\frac{1}{12}$ th the strength of Strychnine, but otherwise corresponds with it physiologically and therapeutically.

Preparations.

Abstractum Nucis Vomicae, gr. $\frac{1}{2}$ –j.

Tinctura Nucis Vomicae, ℥j–v or x, according to the effect desired.

Extractum Nucis Vomicae, gr. $\frac{1}{8}$ – $\frac{1}{2}$. *Extr. Nucis Vomicae Fl.*, ℥j–v.

Strychnina Sulphas, Sulphate of Strychnine, gr. $\frac{1}{100}$ – $\frac{1}{80}$.

Ferri et Strychninae Citras, Citrate of Iron and Strychnine, gr. j–iij.

Syrupus Ferri, Quininae et Strychninae Phosphatum, $\frac{3}{4}$ j–ij. Contains 1 part of Strychnine in 2500. A powerful tonic.

Treatment of Strychnine Poisoning. The *Antidote* is Tannic Acid, to form the insoluble tannate; or a soluble salt of Iodine. Then emetics or the stomach-pump, followed by perfect quiet, which is very important. *Antagonists* are Chloral, Chloroform, Chamomile Oil, Physostigma and Potassium Bromide, the latter being slow of action. The bladder must be frequently evacuated, to prevent re-absorption of the poison.

Physiological Actions. In *Small Doses* Nux Vomica acts as a bitter tonic, stimulates respiration, secretion, appetite and digestion, and sharpens the vision. It increases peristalsis, stimulates both the motor and inhibitory apparatus of the heart, and raises the arterial tension by stimulating the vaso-motor centres, thus contracting the arterioles; though by full doses the arterioles are relaxed.

By *A Full Dose* (Strychnine gr. $\frac{1}{10}$), the pupils are dilated, the limbs jerk, respiration becomes spasmodic, and the lower jaw stiff; a sensation of cerebral tension, sudden shuddering and anxiety; the face wearing an unmeaning smile.

A Toxic Dose (gr. $\frac{1}{2}$ for an adult), on an empty stomach quickly produces heightened reflexes; tonic spasms, especially of the extensor muscles, on the least irritation, quickly succeed each other, with intervals of repose; resulting, after two or three hours at most, in death by asphyxia, from tetanic fixation of the muscles of respiration; consciousness being preserved until CO_2 narcosis sets in.

Strychnine exalts *all* the functions of the spinal cord,—reflex, motor, vaso-motor, and sensory,—the latter being least affected. It has selective action on the large multipolar ganglia in the anterior columns, which it stimulates, and then paralyzes by over-stimulation. A large dose destroys the spinal functions as by one blow. It does not affect the brain directly.

Thebaine, the tetanizing alkaloid of Opium, has an action very similar to that of Strychnine, being a powerful spinal exaltant.

Strychnine Spasms are differentiated from Tetanus—by observing that the spasms of Strychnine are intermittent, those of Tetanus are constant. Furthermore, the meaningless smile, the less marked trismus, the absence of a wound, the rapid course of the symptoms, all point to the action of Nux vomica.

Therapeutics. Nux Vomica and its chief alkaloid are used as a respiratory, cardiac, muscular and nervous stimulant, and as a stomachic tonic. In—

Atonic Dyspepsia,—Tincture of Nux Vomica, gtt. v ter die, before meals.

Gastric Catarrh, especially of drunkards,—the Tincture is excellent.

Constipation, when atony of the bowels,—the Tincture in 10-drop doses is very efficient; not as a purgative, but by increasing peristalsis.

Diarrhæas and Dysentery of epidemic type, are well treated by Strychnine.

Vomiting of Phthisis,—Strychnine is the very best remedy.

Anæmia and Chlorosis,—Strychnine with Iron and Quinine, is invaluable.

Tetanus, especially the idiopathic type, has been often cured by Strychnine.

Neuralgias, especially the visceral,—Strychnine in very small doses.

Local Paralysis of various types, are well treated by injecting Strychnine hypodermically into the affected muscles.

Hemiplegia, not when recent, nor when the muscles have lost their electrical contractility; but when degeneration is about to set in, Strychnine is an excellent remedy.

Diphtheritic Paralysis are almost invariably cured by Strychnine.

Amaurosis, from lead, tobacco or alcohol,—Strychnine has proved useful.

Cardiac Failure from any cause,—Strychnine in very small doses.

Dyspnœa from pulmonic affections,—Strychnine as a respiratory stimulant.

Intermittents,—as adjunct to Quinine, Strychnine is used advantageously.

IGNATIA,—St. Ignatius' Bean.

Source and Composition.—The seed of *Strychnos Ignatii*, or *Ignatia Amara*, a tree found in the Philippine islands. They contain the same ingredients as *Nux Vomica*, though having a much larger proportion of Strychnine.

Preparations. The Tincture is the best.

Abstractum Ignatiæ, gr. ss-j. *Tinctura Ignatiæ*, mjj-x.

Physiological Actions. *Ignatia* closely resembles *Nux Vomica* in action, a poisonous dose producing similar exaltation of the spinal functions, muscular writhing, tetanic spasms, and death by asphyxia or dyspnoea. It especially exalts the susceptibility of the sensory nerves, and those of special sense, for a time; which exaltation is succeeded by an opposite condition manifested by numbness and torpor, with great mental depression. It causes a feeling of constriction about the throat, and a sensation of intense anguish at the pit of the stomach.

Therapeutics. *Ignatia* is recommended for—

Hysteria, to control the general hyperæsthesia, insomnia, *clavus hystericus*, mental excitement or depression, aphonia, diseased appetite, convulsive crying or laughing, etc. (Phillips and Piffard).

Cerebro-spinal Irritability is diminished by small doses, though excited by large ones. *Ignatia* is the best controller of functional phenomena of the cerebro-spinal axis (Piffard).

Globus Hystericus, may often be removed by *Ignatia* given in small doses.

PICROTOXINUM,—Picrotoxin, Fish Poison.

Picrotoxin or *Picrotoxic Acid*, is a neutral principle prepared from the seeds of *Anamirta paniculata*, or *Menispermum Cocculus*, an Asiatic climbing plant, the berries of which are called *Cocculus Indicus*, or Fish-berries. Besides Picrotoxin, the active principle, the shells of the seeds contain two other principles, *Menispermin* and *Paramenispermin*, which are inert; also *Hypopicrotoxic Acid*.

Preparations. There are none official, except the principle itself.

**Extractum Cocculi Fluidum*, ℥j-iiij.

**Tinctura Cocculi* (1 to 8), ℥ij-xv. **Planat's Tincture* (1 to 4), ℥j-v.

Picrotoxinum, gr. $\frac{1}{40}$ – $\frac{1}{20}$ in pill by stomach, or gr. $\frac{1}{80}$ – $\frac{1}{40}$ hypodermically.

Antagonists. *Chloral* is antagonistic to its cerebral and spinal actions, but synergistic to its depressing power over the heart and respiration. *Acetic Acid* gives relief in overdosing, and may have some antidotal power.

Physiological Actions. Picrotoxin is a cerebro-spinal exaltant, affecting especially the centres in the medulla oblongata, and representing the combined action of *Belladonna* and *Nux Vomica*. It causes muscular twitching, incoördination, stupor, delirium, epileptiform convulsions, tonic and clonic spasms alternating, exalted reflexes, trembling, then coma, insensibility and death by paralysis of the heart. The drug paralyzes Setchenow's reflex inhibiting centre, and stimulates the reflex centres in the cord. It stimulates all secretions, but especially the intestinal, causes nausea and vomiting, and slows both heart and respiration, after transiently accelerating them.

Cocculus berries are used to adulterate beer, in order to make it more bitter and intoxicant.

Difference between the Spasms of Picrotoxin and those of Strychnine. The spasms caused by Picrotoxin are choreic and chiefly affect the flexor muscles;—those from Strychnine are tetanic, affecting principally the extensors.

Therapeutics. Picrotoxin is used chiefly in nervous diseases.

Epilepsy is amenable to it, especially in cases attributable to onanism, in anæmic subjects, and where the attacks are nocturnal.

Paralyses, where there is a sense of giddiness, and lightness in the head.

It is especially good in paralysis of the sphincters, and in hemiplegia brought on by cold, as facial paralysis, etc.

Chorea is well treated by Picrotoxin, but requires full doses.

Leucorrhœa, when the discharge is sero-purulent, with lumbar pains.

Dysmenorrhœa is often benefited by the Tincture of *Cocculus* begun two days before the stated period.

Dyspepsia, with severe epigastric pain, and flatulence.

Flatulent Colic is singularly amenable to the influence of *Cocculus*.

Vomiting, with giddiness, headache, and intolerance of light and sound,—is frequently arrested by *Cocculus*.

Sweats of Phthisis may be arrested for days by Picrotoxin, gr. $\frac{1}{100}$ — $\frac{1}{100}$.

Parasitic Skin Diseases,—Picrotoxin as ointment, gr. x ad $\mathfrak{z}\text{j}$.

Pediculi may be killed by the Ointment, but care should be taken to avoid using it on an abraded surface.

ERGOTA,—Ergot of Rye.

Source and Composition.

Ergota, Ergot of Rye,—the sclerotium (intermediate fibrous stage) of *Claviceps purpurea*, a fungus replacing the grain of *Secale cereale* (rye), and growing within its flower. Dose, gr. x—xxx.

It contains, according to Kobert (1885), three active principles, *Ergotinic Acid*, affecting the nervous system, heart and respiration;—*Sphacelinic Acid*, which produces gangrenous ergotism, stimulating the vaso-motor system;—and *Cornutine*, an alkaloid, which possesses the ebolic action, and causes convulsive ergotism. The drug also contains a non-drying oil, with Trimethylamine, and Lactic and Phosphoric Acids. The composition of Ergot is much disputed; and various names have been given to supposed alkaloids and principles believed to exist in it, as Ergotine, Ergotinine, Echoline, Sclerotinic Acid, Scleromucin, Sclererythin, Scleroxanthin, etc.

Ustilago Maydis, Corn Ergot,—grown upon *Zea Mays*, the Indian corn or Maize; probably has a similar composition. One of its constituents is a volatile principle named *Secaline*, supposed to be identical with Trimethylamine.

Preparations.

Extractum Ergotæ Fluidum, \mathfrak{z} ss—ij. *Vinum Ergotæ*, $\mathfrak{z}\text{j}$ — $\mathfrak{z}\text{j}$.

Extractum Ergotæ, Ergotin, gr. j—x. *Squibb's Extract of Ergot* is a good preparation and represents the power of the drug. Dose, gr. $\frac{1}{4}$ —v hypodermically, gr. j—x per orem.

The *Ergotin of Bonjean* is very variable and often inert. *Wigger's Ergotin* is insoluble in ordinary menstrua, and is inert on the vascular apparatus, but causes

enteralgia and gastro-enteritis. *Tanret's Ergotinine* is probably an active alkaloid; its dose is gr. $\frac{1}{30}$ – $\frac{1}{10}$.

**Extractum Ustilaginis Maydis Fluidum*, 3 ss–ij.

Physiological Actions,—are divided into two sets of phenomena, named respectively *Acute* and *Chronic Ergotism*, according as the drug is administered in large doses, or in small quantity for a considerable length of time. *Ustilago* has properties similar to those of the Ergot of Rye, as far as examined.

Acute Ergotism. In large doses Ergot acts a gastro-intestinal irritant, causing nausea and vomiting, gastralgia, colic, thirst, difficult micturition, and purging. It slows the heart, raises the arterial tension enormously, dilates the pupils, and produces pallor, vertigo and frontal headache. Its action on the circulation is due to its inducing arterial anæmia; but whether this is done by contracting the arterioles through local action on their muscular fibre, or by central stimulation of the vaso-motor system, or by causing venous dilatation, is disputed. It certainly stimulates the contraction of unstriated muscular fibre; especially affecting the sphincters and the uterus, causing continuous labor pains and tonic contraction of the sphincter vesicæ, making micturition difficult, if not impossible. It also produces cerebral and spinal anæmia.

Chronic Ergotism occurs in two forms,—(1) the *Convulsive*, (2) the *Gangrenous*,—either usually excluding the other. The convulsions are tetanoid spasms of the flexor muscles, of the uterus, the muscular fibres of the intestines, and the muscles of respiration, ending in coma and death by asphyxia. The gangrenous form begins with coldness and numbness of the limbs, formication all over the body, loss of sensation and the special senses, bullæ of blood and ichor, followed by dry or moist gangrene of the lower extremities, buttocks, and other parts, epileptiform convulsions, coma and death. Autopsy shows changes in the posterior columns of the cord.

Therapeutics. Ergot has a wide field. In—

Conjunctivitis, and inflammations of mucous membranes generally, given internally and applied locally, it proves of striking benefit.

Lax Sphincters of the rectum and bladder are contracted by Ergot.

Acute Dysentery in the congestive stage is well treated by full doses.

Hemorrhoids,—are well treated by Ergot locally, not internally, as it promotes venous congestion.

Hemorrhages of arterial type, not in the passive or venous form.

Cardiac Hypertrophy without valvular lesion,—Ergot to slow the heart.

Aneurism,—Ergot aids coagulation by slowing the blood-current.
Mania due to cerebral hyperæmia,—Ergot is a very useful remedy.
Headache, Migraine, etc., of congestive form,—Ergot acts very well.
Myelitis and Spinal Congestion,—large doses prove very successful.
Cerebro-spinal Meningitis,—Ergot is here one of the very best remedies.
Splenic Enlargement,—Da Costa has found that Ergot administered internally will reduce the size of an enlarged spleen.
Diabetes is best treated by Ergot, according to Da Costa and others.
Amenorrhœa,—when due to plethora, has been frequently cured by Ergot.
Impotence, due to escape of the blood from the dorsal vein of the penis.
Incontinence of Urine,—from paralysis of the sphincter vesicæ.
Uterine Affections, as chronic metritis, subinvolution, fibroids and polypi, congestive dysmenorrhœa, etc.,—Ergot causes firm contraction of the organ, and promotes the absorption of inflammatory products.
Obstetrics. Here Ergot is much used, and often very injuriously. Producing continuous uterine contractions, instead of the natural ones which are intermittent, it should never be used when there is any obstacle in front of the child. Dangers are—rupture of the uterus, laceration of the perineum, paralysis of the foetal heart. At the end of the second stage of labor it is well used, to promote uterine contraction and expulsion of the placenta, and to guard against post-partum hemorrhage.

DIGITALIS,—Foxglove.

Source and Composition. The leaves of *Digitalis purpurea*, from wild plants of the second year's growth. The active principle is named *Digitalin* (?), and occurs in two forms, amorphous (Quevenne's), and crystalline (Nativelle's). Several other principles are claimed for it, as follows: viz.—

According to NATIVELLE. (1) *Digitalëin*, active, crystalline; corresponding to the Digitaline of English writers, and to the Digitoxin of Schmiedeberg.—(2) *Digitalin*, less active, amorphous; the Digitaline of Wiggers.—(3) *An inert substance*.

According to SCHMIEDEBERG. (1) *Digitoxin*, the most active.—(2) *Digitonin*, said by some to be identical with Saponin, by others to be antagonistic thereto.—(3) *Digitalëin*.—(4) *Digitalin*.

Preparations.

Folia Digitalis, gr. ss–ijj. The leaves grown by the Shakers are of inferior quality; the best are the imported leaves from the foreign plant.
Infusum Digitalis, ℥ ss–j; the best preparation.

Tinctura Digitalis (?) ℥v-ʒj. *Abstractum Digitalis*, gr. ss-j.
Extractum Digitalis, gr. ss-ij. *Extr. Digitalis Fluidum*, ℥j-iiij.
 **Digitalinum*, Digitalin, gr. $\frac{1}{80}$ — $\frac{1}{30}$. Complex, expensive, and varies greatly in quality.

Antidotes and Antagonists. The chemical antidote is *Tannic Acid*, but as the tannate is not inert, the stomach should be evacuated. *Aconite* is the best antagonist to the effects of large doses, *Opium* to those of its long-continued use. *Saponin* and *Senegin* are considered to be its most complete physiological antagonists.

Physiological Actions. Digitalis is a cardiac stimulant, an excitomotor, a paralyzant, an anaphrodisiac, a diuretic, and an emetic. It irritates the mucous membranes, causing sneezing, severe gastric disturbance, nausea, vomiting, colic and purging, the discharges being of a grass-green color. It lowers temperature, probably by lessening the blood supply to the tissues, produces headache, irregularity of the heart's action, vertigo and an appearance of vibratory fringes of color around objects.

It causes diuresis by a specific action on the Malpighian tufts (?), as also by increasing the blood pressure. The urea is at first increased, but soon decidedly diminished (?). It lessens the venereal appetite, and impairs the sexual function.

The Heart is slowed by Digitalis, but its force is at the same time increased. Medium doses stimulate the cardiac motor ganglia, the inhibitory apparatus, and the vaso-motor centres, contracting the arterioles; resulting in a great rise of arterial tension. Full doses, continued, exhaust the irritability of the motor ganglia and paralyze the cardiac muscle itself. The recumbent posture must be maintained when Digitalis is given for its cardiac effects.

Lethal Doses lessen the reflexes by stimulation of Setchenow's centre, and paralyze the muscles and the peripheral nerves, motor and sensory. Respiration, at first slowed, becomes rapid and feeble; cyanosis, coma and convulsions follow, and death by sudden paralysis of the heart, which is arrested in systole.

Aconite compared with Digitalis. *Aconite* relaxes the inhibition, but depresses the cardiac motor ganglia;—*Digitalis* increases inhibition, and stimulates the motor apparatus. Both drugs finally paralyze the heart,—*Aconite* by direct depression, *Digitalis* by over-stimulation. Both drugs depress the cardiac muscle. Under *Aconite*, the heart is arrested in diastole,—under *Digitalis*, in systole. The arterial tension is lowered by *Aconite*,—raised by *Digitalis*. *Aconite* acts quickly,—*Digitalis* very slowly;

a fact which makes the latter drug of little value in poisoning by the former. Both drugs slow the heart, but otherwise have antagonistic cardiac actions.

Therapeutics. Digitalis is said by Phillips to be particularly adapted to blondes, and persons of sanguine and indolent temperament. Its chief uses in disease are based on its property as a heart tonic. In—

Mitral Disease, when the heart is rapid and feeble; it moderates hyperæmia of the lungs, and engorgement of the pulmonary veins, by giving the auricle time to empty itself through the obstructed orifice.

Aortic Disease,—Digitalis gives relief when the cardiac muscle fails, and compensatory hypertrophy has not set in. Otherwise it will not.

Irritable Heart of soldiers,—Da Costa finds it often curative.

Dilated Right Heart,—Digitalis gives miraculous relief.

Palpitation, Cardiac Failure, Venous Engorgement, are all well treated by Digitalis, in medium doses.

Simple Hypertrophy, Pericarditis, Fatty Heart, are conditions in which Digitalis must not be used, except temporarily for special reasons.

Dropsy,—both cardiac and renal,—Digitalis is well indicated.

Pneumonia, and other inflammations, in first stage,—it is useful.

Scarlet Fever, in the early stage, and when the kidneys strike work,—Digitalis, in small doses, is an admirable remedy.

Hemorrhage from a large surface, and in the hemorrhagic diathesis.

Congestive Headache, Hemicrania, etc.,—it raises the vascular tone.

Mania, Delirium Tremens, and other congestive mental conditions.

Exophthalmic Goitre,—Digitalis is an excellent remedy.

Fevers. In Germany this drug has been much used as an antipyretic, especially by Wunderlich and Liebermeister. The latter, however, has lately advised against the practice.

Cumulative Action of Digitalis. During a course of this drug sudden alarming symptoms may arise, due to exhaustion of the cardiac motor ganglia. They may be prevented by strictly maintaining the recumbent posture, and stopping the remedy for a few days in every two weeks. This cumulative action has been denied lately by many authorities.

CIMICIFUGA,—Black Snake-root.

Source and Composition. The root of *Cimicifuga racemosa*, an indigenous plant. It contains a Volatile Oil, two Resins, Tannic Acid, etc. The active principle has not been isolated.

Preparations. They must be made from the fresh root.

Extractum Cimicifugæ Fluidum, ℥x-ʒj. *Tinctura Cimicifugæ*, ʒ ss-ij.

**Macrotin* is an impure resin precipitated by water from a concentrated alcoholic preparation. gr. ss-ij.

Physiological Actions. *Cimicifuga* is anti-spasmodic, aphrodisiac, diaphoretic, diuretic, and expectorant. It acts similarly to *Digitalis* on the circulation, and similarly to *Ergot* on unstriated muscular fibre, but is much feebler in activity than either. Its taste is bitter and nauseous, resembling that of *Opium*.

Small Doses stimulate digestion and secretion, especially the secretions of the bronchial mucous membrane and the kidneys. It also stimulates the generative function and the menstrual flow.

Full Doses slow the heart rate while increasing its force, raise arterial tension, and stimulate uterine contraction. In large doses it dilates the pupils, and causes dim vision, vertigo, intense headache, nausea, vomiting, and in some persons sopor.

Therapeutics. *Cimicifuga* is safer than *Digitalis*, and should be more frequently used where the latter drug is indicated. In—

Cardiac Diseases, it is used very efficiently, especially in weak or fatty heart, where *Digitalis* would be dangerous.

Chorea, about the age of puberty,—*Cimicifuga* is very successful.

Puerperal Hypochondriasis has been completely removed by it.

Bronchitis, acute and chronic,—it is valuable as an expectorant.

Rheumatism, of the localized muscular variety,—as lumbago, torticollis, pleurodynia, intercostal rheumatism,—are remarkably benefited by *Cimicifuga*, which has a strong affinity for the muscles.

Neuralgia of various kinds, especially ovarian, also in neuralgic and congestive dysmenorrhœa, it is very efficient.

Uterine Disorders, as subinvolution, in which it may be given with *Ergot*.

Delirium Tremens,—in which *Cimicifuga* is an excellent nerve-tonic.

Impotence, of functional character,—it is a remarkably efficient remedy.

In Obstetrics,—to initiate uterine contraction, to allay after-pains and nervousness after delivery, and to check hemorrhage.

BELLADONNA,—Deadly Nightshade.

Source and Composition. The leaves and root of *Atropa Belladonna*, a European plant of the order *Solanaceæ*. It contains two alkaloids,—*Atropine*, the active principle, and *Belladonnine*,—a coloring matter named *Atrosin*, and *Malic Acid*.

Derivatives of Atropine. It is resolvable into *Tropin* and *Tropic Acid*, and may be made synthetically.

Tropeius is the result of treating Tropin with a mineral acid.

Homotropine is obtained by the action of dilute HCl Acid upon the Amygdalate of Tropin, and is used by ophthalmologists as Hydrobromate of Homotropine. It slows the heart; Atropine quickens it.

Preparations. Those in the first column are of the leaves, those in the second are of the root.

Tinctura Belladonnæ, $\text{m}\bar{\text{j}}-3\text{ss}$. *Abstractum Belladonnæ*, gr. $\frac{1}{8}-\frac{1}{2}$.

Extr. Belladonnæ Alcohol., gr. $\frac{1}{4}-\frac{1}{2}$. *Extr. Belladonnæ Fluid.*, $\text{m}\bar{\text{j}}-\text{v}$.

Atropinæ Sulphas, gr. $\frac{1}{120}-\frac{1}{80}$. Hypodermically, give $\text{m}\bar{\text{j}}-\text{iv}$ of a solution having gr. j ad $3\bar{\text{j}}$, each minim equalling gr. $\frac{1}{480}$.

The Ointment, Plaster and Suppositories of Belladonna are also much used.

Antidotes and Antagonists. In poisoning *Tannic Acid* and emetics should be used. *Opium* is the physiological antagonist for its effects on the cerebrum, pupil, heart, respiration, arterial tension, and kidneys. Physostigmine, Aconite, Pilocarpine and Quinine are each antagonistic to some of its effects; Muscarine to most of them.

Physiological Actions. Belladonna is an irritant narcotic, a mydriatic, an anti-spasmodic, an anodyne; in small doses a cardiac, respiratory and spinal stimulant, in large doses a paralyzer of the motor nerves. It produces dryness of the mucous membranes of the throat, mouth, nose and larynx; and at first lessens the gastric and intestinal secretions, but soon reproduces them in large quantity.

The Heart-rate is at first slowed, but soon becomes very rapid and vigorous, the pulse being doubled in rapidity; the arterial tension being at the same time raised, the circulation is greatly increased. This the drug accomplishes by stimulating the cardiac sympathetic, and paralyzing the pneumogastric, thus stimulating the accelerator apparatus while lessening inhibition. [Digitalis increases both.] The vaso-motor ganglia all over the body are stimulated, but afterwards paralyzed by over-stimulation, the heart weakens, the vessels relax, and the blood-pressure is greatly lowered. Complete motor paralysis follows, then delirium, stupor, and finally death, usually by asphyxia.

The Pupils are dilated by the local or systemic use of the drug, by stimulation of the end organs of the sympathetic, and paralysis of those of the motor oculi, thus increasing the power of the radiating iris fibres, and lessening the action of the circular fibres. Atropine also paralyzes accommodation, and lessens the intra-ocular pressure. The least quantity of Atropine affecting the pupil is stated at gr. $\frac{1}{10000}$ (Wood), gr. $\frac{1}{20000}$ (Roosa), gr. $\frac{1}{40000}$ (Ely), gr. $\frac{1}{128000}$ (Trousseau), gr. $\frac{1}{480000}$ (Loring), gr. $\frac{1}{700000}$ (Donders).

The Brain is congested by Belladonna, a busy delirium being produced, and hallucinations with mental disorder, due to a selective action on the cells of the gray matter.

The Spinal Cord is stimulated from the 2d cervical vertebra to the 10th dorsal, resulting in paralysis of the motor nerves, central and peripheral; power being lost in the lower extremities first. Sensation is slightly impaired, but the muscular irritability is not. Respiration is increased, and the temperature raised. By the increased circulation metamorphosis is greatly pronounced.

A Diffused Eruption of a scarlet color, greatly resembling that of scarlet fever, is often produced by Belladonna on the skin and fauces, with dysphagia and sore throat, and is sometimes followed by desquamation. It is due to capillary congestion caused by the greatly increased circulation.

Diffused rapidly, Belladonna is also quickly eliminated, particularly by the kidneys. The urine of an animal under the action of Atropine will dilate the pupil of another animal. Herbivorous animals and birds are scarcely susceptible to the action of Belladonna, and pigeons are not affected by it at all.

Therapeutics. Belladonna is especially useful in—

Pain of inflammation,—particularly that of gout, rheumatism, neuralgia due to peripheral disturbance, sciatica, cancer, and pelvic affections.

Cerebral and Spinal Hyperæmia, congestive headaches, encephalitis, meningitis and myelitis,—it proves one of the very best remedies.

Erysipelas of superficial and non-vesicular character, and when cerebral,—Belladonna is really curative in 5 ℥ doses every hour, also the extract locally applied.

Inflammation of the lungs, iris, bladder, kidneys and breasts, are all amenable to Belladonna applied locally or used hypodermically.

Constipation due to atony of the bowels, it is remarkably efficient. The Tincture combined with Nux Vomica and Physostigma Tinctures in 15-drop doses at night.

Enuresis of children,—large doses (gtt. x-xx of Tinct. ter die).

Cystitis, recent, from chill,—the tincture internally, and the Extract applied to the perineum.

Spasm of the urethra, bladder, anal sphincter, etc.,—is overcome by it.

Ulcers of the rectum, anal fissures, etc.,—are soothed and healed by the use of the Extract locally.

Ptyalism from Mercury, pregnancy, etc.,—is arrested by Atropine.

Abscesses, boils, carbuncles, and other superficial inflammations, are remarkably benefited by Belladonna with Morphine, used locally.

Typhus and Typhoid in their early stages,—Belladonna is very useful.

Acute Nasal Catarrh, with profuse watery discharge,—it is very efficient.

Sore Throat, with fever, inflammation, redness, and swollen tonsils.

Scarlet Fever. Belladonna is said to be prophylactic (?). It relieves many of the symptoms of this disease, and is well used when the rash is imperfect, the pulse feeble, and the condition adynamic.

Skin Diseases,—notably erythema, eczema, herpes zoster and prurigo.

Sweats of Phthisis,—gr. $\frac{1}{80}$ of Atropine is generally effective.

Asthma and Pertussis are well treated by Belladonna in full doses.

Cardiac Failure when sudden,—Atropine as a cardiac stimulant.

Convulsions, epileptic and puerperal, are often relieved by Belladonna.

Spermatorrhœa and seminal losses are best treated by this remedy.

Poisoning by Opium, Physostigma and Prussic Acid. In Opium poisoning the unsuccessful cases treated by Atropine are due to overdosing therewith. It should be given in very small doses, and for effect.

Ophthalmologists use Atropine to paralyze accommodation, dilate the pupil, contract the vessels, lessen pain, and diminish intra-ocular tension.

*DUBOISIA.

Source and Composition. The leaves of *Duboisia myoporoides*, an Australian tree of the order Solanaceæ. It contains an alkaloid, *Duboisine*, which is apparently identical with Atropine, Hyoscyamine, etc.

Preparations. There are none official.

**Extractum Duboisia*, gr. $\frac{1}{8}$ – $\frac{1}{4}$. **Tinctura Duboisia*, gtt. v–xx.

**Duboisina Sulphas*, Sulphate of Duboisine (Langenberg's), gr. $\frac{1}{100}$ – $\frac{1}{50}$.

Physiological Actions. They are in every respect similar to those of its congener, Belladonna, except that the alkaloid Duboisine is more soluble in water than Atropine, is less irritating to mucous membranes, and more prompt in mydriatic action, but its effects are of shorter duration. It is also less of a cerebral excitant, and more of a calmative and hypnotic. Ringer says that on man its action is more powerful than that of Atropinè, but less powerful on frogs.

Therapeutics. Duboisine has hitherto been used only by ophthalmologists as a mild substitute for Atropine, though it may be used instead of the latter in many conditions, especially the night-sweats of phthisis, respiratory neuroses, and cardiac failure. In—

Mania, puerperal and other forms,—Duboisia is of remarkable value, though at first it rather increases the maniacal excitement.

STRAMONIUM,—Thorn Apple.

Source and Composition. The leaves and seeds of *Datura Stramonium*, a bushy, indigenous herb, also of the order Solanaceæ. It contains an alkaloid, *Daturine*, probably identical with Atropine, also Malic Acid, etc.

Preparations.

Extr. Stramonii (Foliorum), gr. $\frac{1}{8}$ -j. *Extr. Stramonii Fl.*, m℥-v.

Tinctura Stramonii, m℥v-℥ ss. *Unguentum Stramonii*, 1-4 of lard.

Physiological Actions. They are similar to the actions of Belladonna in almost every particular; but Stramonium is more powerful, and acts chiefly on the sympathetic system, not affecting the motor or sensory nerves. It excites a greater degree of cardiac irregularity, and a more furious delirium; and seems to have a special affinity for the generative apparatus.

Therapeutics. Stramonium is chiefly used to relieve pain. In—*Dysmenorrhœa and Neuralgia*,—it is combined with Opium and Hyoscy. *Spasmodic Affections*, as asthma, laryngeal cough, hepatic colic, etc.

Asthma,—the leaves are smoked to advantage at the commencement of a paroxysm, the smoke being drawn into the lungs.

Mania of furious character, especially the puerperal form, with suicidal tendency,—Stramonium is highly serviceable, in 10-20 m doses of the tincture every three or four hours, until relief is obtained.

Nymphomania, with great mental depression,—it is very useful.

Chorea and Stammering,—Stramonium is a good remedy.

Ulcers of irritable character,—the Ointment is much used.

Tic Douloureux and Sciatica,—it is often efficient.

HYOSCYAMUS,—Henbane.

Source and Composition. The leaves of *Hyoscyamus niger*, a biennial plant, also of the order Solanaceæ. Its alkaloid, *Hyoscyamine*, is probably identical with Atropine, Daturine and Duboisine; from it is derived *Hyoscine*, a liquid alkaloid yielding Tropic Acid and Pseudotropine.

Preparations.

Extr. Hyoscyami Alcohol., gr. $\frac{1}{4}$ -j. *Abstractum Hyoscyami*, gr. $\frac{1}{8}$ -j.

Tinctura Hyoscyami, ℥ ss-℥ j:—as a hypnotic, ℥ ij-℥ j is necessary.

Hyoscyaminæ Sulphas, gr. $\frac{1}{40}$ -j. **Hyoscine*, gr. $\frac{1}{100}$ - $\frac{1}{50}$ hypodermically.

Incompatible most frequently Prescribed with Hyoscyamus is Liquor Potassæ. All the fixed caustic alkalies destroy its alkaloid, as well as those of the allied plants.

Physiological Actions. The action of Hyoscyamine is similar to that of Atropine, Duboisine and Daturine, except that it is the least powerful and least irritant of the group, and the most calmative and hypnotic. It is more stimulant to the vaso-motor system and the cardiac accelerator apparatus than is Daturine, but is less active upon the pneumogastric. Its delirium is never furious and is without hyperæmia, but is accompanied by insomnia. *Hyoscine* is still less active and less irritant, is decidedly anodyne and hypnotic, and very depressant to the respiration.

Therapeutics. Hyoscyamus is principally used as a hypnotic and anodyne when Opium is contraindicated. In—

Acute Mania with high motor excitement, obstinate insomnia and varied hallucinations,—it is by far the best agent to use.

Chronic Mania has been benefited by it more than by any other drug.

Insanity marked by frequent delusions,—it is very efficient.

Delirium Tremens, and the delirium of fevers,—it is an excellent hypnotic, but needs to be used in larger doses than are generally employed.

Monomania of hypochondriacs, is alleviated and often cured by it.

Neuralgias have been much benefited by Hyoscine hypodermically.

Nervous Coughs, Whooping Cough, especially a dry, tickling night cough, —are greatly alleviated by Hyoscyamus.

Locomotor Ataxia, Hyoscyamine for the pains and in coördination.

Paralysis Agitans, mercurial tremor, etc.,—it palliates the trembling.

Colic of various forms,—Hyoscyamus has long been used.

Constipation. Purgatives are rendered more efficient and less drastic by combination with the Extract of Hyoscyamus.

CAMPHORA,—Camphor.

Camphor is a concrete, volatile, waxy solid, obtained from the volatile oil of *Cinnamomum Camphora* (*Camphora officinarum*), a tree indigenous in China, Japan, Borneo, Formosa, etc. It is slightly soluble in water (1 to 1300), but freely so in Alcohol, Ether, Chloroform, Carbon Bi-sulphide, Oils and Milk.

Derivatives. *Camphor-cymol* is obtained by its distillation with Zinc Chloride;—*Camphoric and Camphretic Acids* result respectively from its lesser or greater oxidation.

Preparations.

Aqua Camphoræ, Camphor Water,—strength, 8 in 1000, with 16 parts of Alcohol to aid in the suspension of the Camphor. Dose, ʒj-iv.

Spiritus Camphoræ, strength, 10 per cent. Dose, ʒv-xx.

Linimentum Càmphoræ,—has 1 of Camphor to 4 of Cotton-seed Oil.

Linimentum Saponis. Soap, Camphor, Ol. Rosmarini, Alcohol, Water.

Càmphora Monobromata, Monobromated Camphor, gr. j-x, in emulsion.

**Rubini's Tincture* is a saturated solution in Alcohol;— Dose, gtt. iv-xx.

**Raspail's "Eau Sedatif"* is used externally, and consists of Ammonia, Salt, Camphor, Water, and Alcohol. See page 36.

Physiological Actions. Camphor is antispasmodic, anodyne, antiseptic, diaphoretic, a stimulant expectorant, a cerebral excitant, a gastro-intestinal irritant, and a counter-irritant. It has an acrid, hot taste; irritates the skin and mucous membranes, in quantity exciting severe gastric inflammation, with all the effects of an irritant poison.

In Medicinal Doses it stimulates the vaso-motor system and the cardiac motor ganglia, and lessens the influence of the pneumogastric; thus increasing the circulation and raising the arterial tension. It also stimulates respiration and mental activity, even producing intoxication; promotes perspiration, allays pain, and increases the menstrual flow and the sexual appetite; but its continued use depresses the generative function. "*Camphora per nares castrat odore mares.*"

Large Doses depress the heart and lower arterial tension and diminish the reflex functions of the cord, producing coldness of the surface, insensibility, coma, convulsions and perhaps death.

Elimination takes place by the bronchial mucous membrane, skin and kidneys. Camphor has often caused dysuria.

Therapeutics. Camphor was much used by the older physicians, and is yet greatly valued in China and Japan. It has a reputation for very uncertain action. It is, however, much employed in—

Cholera and choleraic diarrhœa;—allaying intestinal pain and cramp, checking intestinal secretion, and restoring warmth to the extremities.

Summer Diarrhœa, from nervous exhaustion and irritability,—a few doses of the Spirit will often check this complaint promptly.

Infantile Diarrhœa,—the Spirit, in milk, is an effective remedy, especially when the flux is induced by nervous irritation.

Vomiting and Gastralgia,—Camphor has long been effectively employed.

Cardiac Depression,—it acts promptly as a cardiac stimulant.

Nervousness, nervous headache, restlessness, delirium tremens, hypochondriasis, hysterical convulsions, etc.,—as a sedative and antispasmodic.

Nymphomania, Erotomania, etc.,—it is an excellent palliative.

Whooping-cough, cough from habit, and the sympathetic cough of mothers, —the monobromide in 5-grain doses, with Syrup of Tolu and Mucilage.

Capillary Bronchitis with depression,—as a stimulant and expectorant.
Fevers, typhoid and the exanthemata,—small doses in milk frequently used are of great value to promote sleep, quiet the reflexes, and antagonize the cardiac depression.

Dysmenorrhœa and *After pains* are much relieved by 10-grain doses.

Chordee and *Strangury* are relieved by drachm doses of the Spirit.

Toothache,—Camphor and Morphine in a flaxseed poultice, to the cheek.

Gangrene,—the Spirit internally and the powder locally to the surface.

Myalgia, *Lumbago*, etc.,—the Liniment is effectively palliative.

Catarrhal Colds are readily broken up by Camphor if used in the incipency internally and by olfaction. Beard's Cold Powder is made by dissolving 5 parts in Ether to a thick consistence, then adding Ammonium Carbonate 4 parts, and Opium 1 part. Dose, gr. iij-x.

ASAFÆTIDA,—Asafetida.

Source and Composition. A fetid gum-resin which exudes from incisions made in the living root of *Ferula Narthex* and *Ferula Scorodosma*, Afghan plants. Its principal constituent is a Sulphuretted Volatile Oil, which chiefly consists of *Allyl Sulphide*. It also contains a Gum and a Resin, with Ferulic, Malic, Acetic, Formic and Valerianic Acids.

Preparations.

Tinctura Asafætida,—strength 20 per cent., ℥ ss-ij.

Mistura Asafætida, Lac Asafetida, Milk of Asafetida, ℥ ss-ij.

Pilule Asafætida, 1-4 pills. *Pilule Aloës et Asafætida*, 1-4 pills.

Pilule Galbani Compositæ, 1-4 pills. Asafetida, Galbanum and Myrrh.

Emplastrum Asafætida.

Physiological Actions. Asafetida is a powerful antispasmodic, a nerve and cerebral stimulant, a stimulating expectorant; as well as tonic, laxative, diuretic, diaphoretic, emmenagogue, aphrodisiac and anthelmintic. Its taste and odor are very nauseous and persistent.

Small Doses Continued are said to cause impaired digestion, alliaceous eructations, acidity in the fauces, gastralgia, flatulent distention, fetid flatus, burning urination, diarrhœa and tenesmus. *Full Doses* produce various phenomena of nervous or hysterical type.

It stimulates the circulation by raising the arterial tension, increasing the power of the cardiac motor ganglia, and relaxing the inhibition. It also stimulates the brain, even to a very pleasant intoxication, and produces a subjective sensation of warmth without any rise of the body tem-

perature. It stimulates the secretions and excretions, the general nervous system, the menstrual flow and the sexual appetite. In Asia it is used as a condiment with food, and though extremely nauseous at first to most people, a taste for it may be readily acquired.

Therapeutics. The disgust which most every one feels for this remedy makes its use very restricted. It is a valuable remedy in—

Flatulent Colic of infants,—the Mistura in teaspoonful doses.

Infantile Convulsions,—the Mistura as an enema is extremely useful.

Hysteria and Hypochondriasis, with indigestion and flatulence,—there is no better remedy to fulfill all the indications present.

Constipation, and amenorrhœa, in anæmic subjects, with ovarian and intestinal torpor,—the Pill of Aloës and Asafetida.

Bronchial Affections, cough of habit, etc.,—there is no better remedy.

Chronic Catarrhs, with cough and dyspnœa,—combined with the Chloride of Ammonium it makes a very useful remedy.

AMMONIACUM,—Ammoniac.

Source and Composition. Ammoniac is a gum-resinous exudation from *Dorema Ammoniacum*, a Persian plant. It contains a Volatile Oil (not sulphuretted), a Gum and a Resin. Dose, gr. x-xxx.

Preparations.

Emplastrum Ammoniaci cum Hydrargyro,—Ammoniac 72 per cent.

Mercury 18 per cent., with Lead-plaster, Sulphur, Olive Oil, etc.

Mistura Ammoniaci, ℥ss-j.

Emplastrum Ammoniaci.

Physiological Actions,—are similar to those of Asafetida, but much less powerful. It is a stimulating expectorant, a laxative, and has a mild irritant action on the skin.

Therapeutics. Ammoniac is not much used. In—

Chronic Bronchial Affections, especially of the aged,—the Mistura, with the Chloride or Carbonate of Ammonium, is extremely useful, facilitating expectoration and lessening wheezing.

Asthma, spasmodic and hysterical,—it is highly useful, if combined with a little Hyoscyamus or Conium.

Glandular Enlargements, and indolent inflammatory swellings,—the plaster as a stimulating alterative and resolvent.

VALERIANA,—Valerian.

Source and Composition. The root of *Valeriana officinalis*, a British plant. It contains a Volatile Oil, from which are developed by oxidation *Valerianic Acid*, *Valerene* and *Valerol*.

The Valerianic Acid of Pharmacy is a product of the oxidation of Amylic Alcohol (fusel oil);—it is not identical with the acid derived from the plant, though from the latter are prepared the Valerianates.

Preparations. The Oil is by far the best.

Abstractum Valerianæ, gr. x—ʒ ss. *Tinctura Valerianæ*, ʒ ss—ʒ ij.

Oleum Valerianæ, mjj—v. *Tinctura Valerianæ Ammoniata*, ʒ ss—ʒ ij.

The Ammoniated Tincture and Fluid Extract are extremely nauseous, and the latter is too bulky to be used. The taste is best covered by combination with Cinnamon. The various Valerianates (of Zinc, Ammonia, Iron, and Quinine) are made with the acid produced from Amylic Alcohol, and do not represent the action of the plant, but rather that of the bases from which they are respectively prepared.

Physiological Actions. Valerian is generally classed as an antispasmodic, or a nerve tonic. It is powerfully sedative to reflex excitability, and diaphoretic, laxative and anthelmintic.

Its taste and odor are horrible, except to cats, they being extravagantly fond of it. It greatly excites the sexual appetite in these animals, probably from the resemblance of its odor to their own when under venereal excitement. After a time, it produces in them violent spasms and convulsions.

In Full Doses it increases the action of the heart and raises the temperature, in most persons producing exhilaration, and in some slight mental disturbance, with formication of the hands and feet. It reduces motility and sensibility, and decreases reflex excitability, being antagonistic to the actions of Strychnine, Brucine, Thebaine, etc. Long used, it induces a condition of low melancholy and hysterical depression.

Large Doses cause hiccough, nausea, vomiting and diarrhoea, with tenesmus of the bladder, frequent micturition, and lithates in the urine. The mental disturbance may proceed even to delirium, while hallucinations and excitement are usually produced, together with great restlessness and spasmodic movements of the limbs.

Therapeutics. Valerian was formerly much used in *Epilepsy*, but it was probably only useful in the hysterical form (Hystero epilepsy). It is a valuable remedy in—

Hysterical Disorders of all kinds, wherein it is often very beneficial.

Flatulence of the hysterical and in infants is quickly relieved by it.
Nervous Headache is often well treated by the Valerianate of Ammonium in 10-grain doses, administered in the form of an elixir.
Hypochondriasis,—especially at the climacteric period, with flatulence.
Coughs of nervous type, and *Whooping-cough*,—it is often efficient.
Diabetes Insipidus,—Valerian is more than palliative; in large and increasing doses it has frequently proved curative.
Convulsions due to worms,—Valerian is doubly indicated.
Delirium, with depression of the vital energies,—it is very beneficial.
Coma of Typhus,—the oil was remarkably successful in 135 cases out of a series of 172 treated by it.

SERPENTARIA,—Virginia Snake-root.

Source and Composition. The root of *Aristolochia Serpentina*, and *Aristolochia reticulata*, plants indigenous to the United States. It contains a Volatile Oil, a Camphor-resin, and *Aristolochine*, a bitter principle, soluble in both alcohol and water.

Preparations. They should be of the fresh root.

Extr. Serpentariæ Fluid., ℞x-xxx. *Tinctura Serpentariæ*, ℥ss-℥ij.
Tinctura Cinchonæ Composita, ℥j-℥ij;—has 2 parts of Serpent. in 100.

Physiological Actions. *Serpentaria* is a stimulant tonic and expectorant, also a cardiac stimulant, as well as diaphoretic, diuretic, emmenagogue, aphrodisiac, and somewhat antiperiodic. Its taste is warm and pungent, its odor characteristic.

Small Doses promote appetite and digestion, increase the bronchial and intestinal secretions, the action of the heart, the cutaneous circulation, and the surface temperature; and produce considerable mental exhilaration.

Large Doses are irritant, causing nausea and vomiting, vertigo and headache, with colic, borborygmi, rectal tenesmus, flatulent distention, and frequent but not watery stools. The irritant action seems to produce gas rather than fluid. Itching of the anus and hemorrhoids are occasionally caused by its use.

Therapeutics. *Serpentaria* is chiefly used as a vehicle for other stimulant drugs, but has many uses of its own. In—

Bronchial Affections, it is exceedingly valuable as a stimulant expectorant, and may be combined with other expectorants.

Pneumonia of Typhoid form,—is a good vehicle for *Ammonii Carbonas*.

Exanthemata, when depression exists,—it is a good stimulant.

Typhoid Conditions generally,—Serpentaria is well indicated.
Amenorrhœa of anæmia and chlorosis,—it is a useful emmenagogue.
Functional Impotence,—it will often restore the waning sexual power.
Remittent Fever,—as a vehicle for Cinchona it acts well.
Bilious Vomiting,—it checks the nausea and settles the stomach.
Diphtheria, Scarlatina, etc.,—An Infusion is excellent as a gargle.

CANNABIS,—Hemp.

Source and Composition. The flowering tops of *Cannabis sativa*, varieties *Indica* and *Americana*; the latter having effects similar to but less powerful than those of the Indian plant. It contains a Resin, named *Cannabin*, and a Volatile Oil. From the oil are obtained a light hydrocarbon, *Cannabene*, and a crystalline substance, *Hydride of Cannabene*.

The indigenous "Indian hemp," *Apôcynum Cannabinum*, is a different plant, possessing active diuretic properties, but none others of marked character.

Preparations. There are but three, viz.—

Tinctura Cannabis Indicæ, ℥v–ʒj. *Extr. Cannabis Indicæ*, gr. $\frac{1}{8}$ –j.

Extractum Cannabis Indicæ Fluidum, ℥j–v.

The corresponding preparations of *C. Americana* are given in larger doses.

Preparations of Hemp commonly used in the East are—

Churrus,—an impure resin, obtained by rubbing the leaves together.

Gunjah,—the dried leaf as sold in the bazaars for smoking purposes.

Siddhi, Hashish or Bhang,—an Arabian confection, containing the leaves mixed with aromatics and various fruits.

Physiological Actions. Cannabis is antispasmodic, analgesic, anæsthetic and narcotic, a cerebro-spinal stimulant, and a powerful aphrodisiac. It increases intellectual and motor activity, stimulates the vaso-motor nerves, raising the arterial tension, and depresses sensation.

Large Doses cause a pleasurable intoxication, during which the traits peculiar to the individual are exalted; the ideas follow each other so rapidly as to produce a sense of great prolongation of time, minutes seeming as if hours or even days. With this occurs increased sexual desire, great muscular activity, and sensations of double consciousness and enormous dimensions; the sight and hearing are exalted, the pupils dilated, anæsthesia sets in, the reflexes are lowered by stimulation of inhibition (Setchenow's centre?); and if the dose be a heavy one a cata-

leptic state is induced. Sleep or coma follows, according to the size of the dose, but death has never been caused by this drug.

After-effects are dullness, heaviness, vertigo, headache, and confused thought; but no nausea, no vital depression, no constipation. Repeated use of the drug produces mental weakness and impotence, the result of over-stimulation. It causes a ravenous appetite, and increases the energy of the uterine muscular fibre, but has no power to initiate uterine contractions.

Therapeutics. Cannabis was formerly much used as an anodyne and hypnotic, and as an anæsthetic during surgical operations. It is out of fashion now, but very useful in—

Migraine, or sick-headache,—in which it often prevents the recurrence of the attacks, seeming to act specifically on Ringer's migraine centre.

Neuralgia,—full doses during the attack, smaller doses in the intervals.

Uterine Affections, as chronic metritis, subinvolution, menorrhagia, dysmenorrhœa, etc.,—its powers as an anodyne and stimulant of the uterine muscular fibre render it a very efficient agent.

Traumatic Tetanus, *Paralysis Agitans*, etc.,—large doses are required in order to lower reflex activity.

Delirium Tremens,—if any hypnotic be used here, Cannabis is the best.

Dysuria and retention of the urine are often relieved by it. In spasm of the bladder and other painful affections of that organ it will be found a most efficient remedy.

Impotence of functional character,—Cannabis is a very useful remedy and may be well combined with Ergot and Nux Vomica.

Gonorrhœa,—it lessens the discharge, inflammation, burning pain and restlessness, and allays chordee. The tincture of the American plant is very useful here, being fully as efficient as Copaiba or Sandal, and much more agreeable to the taste. It should be prepared from the fresh plant, and given in 3–5 drop doses 3 or 4 times a day, after the subsidence of the acute symptoms.

ERYTHROXYLON,—Coca.

Source and Composition. The leaves of Erythróxylon Coca, a Peruvian shrub, which should not be confounded with Cocoa (Theobroma Cacao, the chocolate-tree; see page 83). It contains a crystalline alkaloid—*Cocaine*, which by heat and HCl Acid is resolved into Benzoic Acid and another alkaloid, *Ecgonine*;—also a volatile, liquid alkaloid, *Hygrine*, an aromatic oil and coca-tannic acid. Dose of the leaves, ʒj–iv.

Preparations. *Extractum Erythroxyli Fluidum*, ℥ ss–ij.

**Cocainæ Hydrochloras*, gr. $\frac{1}{8}$ –ij. Locally or hypodermically as anæsthetic, aqueous solutions of 2 to 5 per cent. (gr. jss–iij ad ℥ j). are used; also Oleates, 5 to 20 per cent.

**Wines, Glyceroles, Pastes, Lozenges, etc., of Coca*,—are sold in great variety.

Physiological Actions. Coca is an aromatic bitter tonic, a cerebral and nervous stimulant, and a diuretic. *Small Doses* improve digestion, stimulate respiration, increase the heart's action after a brief depression, raise the arterial tension, and increase the irritability of the sensory nerves. It stimulates the brain by increasing its blood-supply, producing wakefulness and a marked diminution of the sense of fatigue. Though decidedly diuretic, it lessens the quantity of urea, by checking the processes of waste. *Large Doses* cause impairment of coördination, hallucination, delirium; and paralyze the cardiac motor ganglia, the motor and sensory nerves and the respiratory centre. The power of Cocaine in solution as a local anæsthetic to mucous surfaces is very great over a limited area. Applied to such structures as the conjunctiva, Schneiderian membrane, mucous covering of the glans penis; or injected hypodermically in other locations, it blanches the structures and causes a profound but temporary anæsthesia throughout a small space.

Therapeutics. Coca-leaves are chewed by the Peruvians, to sustain them during their arduous labors. Their example was imitated by Weston, the pedestrian, during his protracted walks. In South America, it is used much as we use tea and coffee. It is useful in—

Wasting Diseases, as a stimulant to digestion, and to retard waste.

Convalescence from fevers and other acute maladies.

Migraine and Neuralgia, with depression,—it is of real utility.

Stomatitis and Gastralgia,—for its benumbing effect.

As a Local Anæsthetic,—Cocaine has numerous applications, which are being extended more widely every day. It is already a necessity to the ophthalmogist, and the laryngologist, while for minor operations in general surgery its use is becoming almost universal. In congestions of mucous surfaces it is being freely employed, also as an application in skin diseases, to the uterus in labor, and hypodermically for superficial neuralgiæ.

CAFFEINA,—Caffeine.

Source. Caffeine is a feeble alkaloid found as a tannate in the seeds of *Coffea Arabica*, *Camellia Thea*, *Paullinia sorbilis*, etc. It is identical with *Theine* and *Guaranine*, and contains more nitrogen than almost any

other alkaloid. The seeds of the coffee-plant also contain Sugar, Tannic and Caffeic Acids; the latter in roasting is partly converted into Methyamine, and the sugar is changed into Caramel.

Preparations.

Caffeina, Caffeine, gr. j-v. **Caffeina Citras*, Citrate of Caffeine, gr. j-v.

Physiological Actions of Coffee. It is a cerebro-spinal stimulant, a stomachic tonic and a laxative. It is decidedly diuretic, and somewhat antiperiodic and antiseptic. The green bean produces very different effects from those of the roasted one. It increases secretion, blunts sensation, exalts reflex excitability, increases mental activity, and produces insomnia and great nervous restlessness. It first briefly stimulates the heart and raises arterial tension, but soon depresses both. The wakefulness is preceded by a brief period of drowsiness. As a beverage Coffee assists digestion, promotes intestinal peristalsis, allays the sense of fatigue and hunger, and lessens tissue-waste, and consequently the excretion of urea (?). Used to excess it disorders digestion, and causes functional disturbance of the nervous system, shown by headache, vertigo, mental confusion, and palpitation of the heart. Caffeine in large doses paralyzes both the cardiac muscle and its ganglia in dogs, and if given in sufficient quantity would no doubt prove poisonous to man. It is an efficient diuretic.

The Common Stimulant Beverages Compared.

Coffee is more stimulating than Coca, and less sustaining. It is apt to cause severe palpitation of the heart, and may disorder digestion.

Tea (*Camellia Thea*) is the most refreshing and stimulating member of the group. Used to excess it powerfully affects the stability of the motor system, causing tremulousness, and produces flatulent dyspepsia.

Coca (*Erythroxylon Coca*) is more sustaining, and less of a stimulant.

Cocoa (*Theobroma Cacao*, the Chocolate-tree) is more directly nutritious than any of the group, containing a large quantity of fat, *Oleum Theobromæ* (Cacao-butter), which makes it difficult of digestion to many.

Maté (*Ilex Paraguayensis*, Paraguay tea) is supposed to be intermediate in its effects between tea and coffee. It also contains Caffeine.

Guarana (*Paullinia sorbilis* of Brazil); contains an alkaloid—*Guaranine*, which is identical with Caffeine. It is well used in the treatment of nervous sick-headache in doses of ℥xx of the Fluid Extract.

Therapeutics. It is a valuable stimulant in many forms of nervous depression, and has proved especially efficacious in—

Headaches of neuralgic or nervous type, the pain being general over the head,—gr. j of Caffeine every half hour, or the Citrate.

Choleraic Diarrhoea, and that of phthisis,—it checks outward osmosis by stimulating the depressed nervous apparatus.

Dropsy, cardiac and renal,—Caffeine as a diuretic and cardiac stimulant.

Cervico-brachial Neuralgia,—Caffeine hypoder., gr. j, increased to gr. v.

Lithæmia and Gout,—a tincture of the green bean has marked diuretic and antispasmodic powers, and is very useful in these conditions.

Insomnia of chronic alcoholism,—gr. $\frac{1}{2}$ of Caffeine hypodermically.

Adynamic Fevers,—it may well be used in place of alcoholic stimulants.

Intermittents,—Coffee has a curative reputation among the inhabitants of the Philippines, which is corroborated by the Dutch physicians.

Asthma,—if not used habitually, it is valuable in the paroxysm.

Opium Narcosis,—Caffeine hypodermically, or better still, strong black coffee, to antagonize the increasing torpor of the nervous centres.

ALCOHOL,—Alcohol.

An Alcohol is a volatile organic compound, which contains no N, has a great affinity for Water, and reacts with acids, forming, H_2O and Ethers. Alcohols are therefore analogous to the metallic hydrates, and Ethers are analogous to salts. An Alcohol is obtained by distillation from the fermented product of grape sugar or some substance (as starch) easily converted into grape sugar, which in the presence of certain low vegetable organisms (as the yeast-plant) splits up into Alcohol and CO_2 . It has been made synthetically by shaking Olefant Gas (C_2H_4) with strong Sulphuric Acid, then diluting and distilling. $C_2H_4 + H_2O = C_2H_6O$, Ethylic Alcohol. If very slowly oxidized it forms Aldehyde (C_2H_4O); if less slowly, Acetic Acid ($C_2H_4O_2$); if quickly, as in burning, CO_2 and H_2O , which are in all cases the ultimate products of its continued oxidation.

Four most important Alcohols, and their Sources, are—

Methylic Alcohol, CH_4O ,—Methyl Hydrate, Wood-spirit.

Ethylic Alcohol, C_2H_6O ,—Ethyl Hydrate, Grain-spirit, the common "Alcohol."

Amylic Alcohol, $C_5H_{12}O$,—Amyl Hydrate, Potato-spirit, Fusel Oil.
 *Occurs in the excessive distillation of fermented grain, along with the Ethylic Alcohol.

Phenylic Alcohol, C_6H_6O ,—Phenol, Carbolic Acid, from coal-tar. [See page 126.]

Official Preparations of Alcohol and those in general use, are—

**Absolute Alcohol*, sp. gr. 0.794. That of the shops is rarely stronger than 98 per cent.

Alcohol, sp. gr. 0.820, contains 91 per cent. by weight of absolute Alcohol.

**Alcohol*, Rectified Spirit, sp. gr. 0.835, contains 85 per cent. of absolute Alcohol. Has no Fusel Oil. It is often spoken of as “56 over proof,” meaning that to reduce 100 volumes of it to the strength of proof spirit requires 56 volumes of water.

**Proof Spirit*, sp. gr. 0.920, contains 49 per cent. of Alcohol.

Alcohol Dilutum, sp. gr. 0.928, contains equal measures of Alcohol and Water.

Spiritus Frumenti, Whiskey, from rye or corn (U. S.), barley (Scotch), potatoes (Irish). It has 44 to 50 per cent., by weight, of Alcohol, also Ethers developed by the action of Acetic and Butyric Acids on the Alcohol, and traces of Fusel Oil, even in the best. It should be not less than two years old.

Spiritus Vini Gallici, Brandy. Pale, colored by cask. Dark, has caramel. Its Alcoholic strength is the same as Whiskey, and its Ethers are developed by age. Supposed to be distilled from grapes; but is generally prepared artificially by adding to high wines Acetic or Nitric Ether, Caramel, and Logwood or Catechu, for astringency. It should be at least four years old.

Vinum Album, White Wine. It should contain 10 to 12 per cent. by weight of Alcohol, and is made by fermenting the unmodified juice of the grape, freed from seeds, stems and skins.

Vinum Album Fortius, Stronger White Wine. It should contain 20 to 25 per cent. of Alcohol by weight; and is made by adding 1 part of Alcohol to 7 of *Vinum Album*.

Vinum Rubrum, Red Wine, is made by fermenting the juice of colored grapes with their skins. It should contain 10 to 12 per cent. by weight of Alcohol.

**Rum* is obtained from the distillation of fermented molasses.

- * *Gin* is distilled from rye or barley, and flavored in Holland with Juniper berries and Hops; in England often with Oil of Turpentine, various cheap Aromatics, Acetate of Lead, Sulphate of Zinc, Cayenne Pepper, etc. Pure gin is an efficient diuretic, from the Oil of Juniper contained in it, but is so rarely obtained pure that other diuretics are better.
 - * *Vinum Portense*, Port Wine, has 30 to 40 per cent. Alcohol. Is almost impossible to be obtained pure, being usually made artificially and heavily fortified with Alcohol.
 - * *Vinum Xericum*, Sherry, a dry spirituous wine, also generally made to order by the so-called rectifiers.
 - * *Sparkling Wines*, Champagne, Catawba, etc., are sweet, being bottled before fermentation has ceased; have 8 to 12 per cent. Alcohol, and considerable CO_2 .
 - * *Sweet Wines*, Burgundy, Tokay, Muscatel, Malaga, Angelica, Madeira, etc., are of low Alcoholic strength, 6 to 7 per cent., unless fortified.
 - * *Light Red Wines*, Claret, Red Rhine, Concord Port, have 5 to 6 per cent. Alcohol, Tannic Acid, grape coloring matter, etc.
 - * *Dry Acid Wines*, Rhine, Moselle, Ohio, Catawba, etc. Fermentation complete. Alcohol 5 to 7 per cent.
 - * *Beer*, by slow fermentation, yeast falling. Alcohol 2 to 3 p. c. }
 - * *Ale*, by rapid fermentation, yeast floating. Alcohol 2 to 6 p. c. } Also
 - * *Porter, Stout*, have much coloring matter. Alcohol 4 to 6 p. c. }
- contain Extract of Malt, CO_2 , Lactic Acid, salts of Potassium and Sodium, Aromatics, etc.

Qualities necessary in a good Wine. Unity of taste, bouquet, body, flavor and satisfaction to the palate of the consumer. The bouquet (aroma) is due to α -Nanthic Ether, produced by the reaction of α -Nanthic Acid and the Alcohol.

Physiological Actions of Alcohol. It is a cerebral excitant and depressant, and a narcotic poison. It is anæsthetic, antiseptic, and anti-parasitic, a mild counter-irritant, and coagulates albumen by abstracting its water. It is very diffusible, partly oxidized by the organism, partly excreted.

In Small Doses Alcohol relaxes the vessels, stimulates the gastric glands, promotes appetite and digestion, lessens the elimination of waste products, (Urea and CO_2), causes a subjective sensation of heat, and slightly raises the body temperature. It briefly stimulates the heart, prolonging its systole and reducing the length of the diastole, and increases the functional activity

of all the organs. A portion is oxidized by the organism ($\frac{2}{3}$ in 24 hours?), yielding force, which is utilized as nervous, muscular and glandular power.

The continued use of small or moderate doses congests the stomach and liver, over-stimulates the gastric glands and the hepatic cells, to the production of pathological secretions, causes gastric catarrh and morning vomiting of mucus, and impairs digestion. By irritation it sets up hyperplasia of the submucous connective tissue (sclerosis), especially in the stomach, brain, kidneys and liver (cirrhosis); produces fatty degeneration (steatosis) of the blood, the arterial walls, and the various organs; and depresses the heart and the arterial tension. Epilepsy, paraplegia, amaurosis and insanity may result from the long continued use of spirits, Alcohol having an especial affinity for the nervous system. The malt liquors (beer, ale, etc.) are less prone than the spirituous to affect the brain, but are very apt to set up fatty degeneration of the liver and heart.

In Large Doses Alcohol precipitates pepsin and destroys its activity as a ferment, arrests digestion, produces exhilaration, intoxication, hallucinations, delirium, muscular incoördination, depression of the heart, lowered arterial tension and body temperature, abolished reflexes and coma.

A Toxic Dose, after a very brief period of excitement, produces insensibility, stertorous breathing, dilated or contracted pupils, complete muscular resolution, and death by paralysis of the heart and respiration.

Alcohol is a food within narrow limits; $\frac{2}{3}$ iss per diem (?) is the quantity which the adult organism can oxidize; more than this is a poison (?), setting up structural changes in the organs, and lowering the resistance power of the body to morbid influences. It has frequently caused an intractable form of phthisis. The very young and the very old bear more Alcohol relatively than the adult. Alcohol has been proven to exist normally in the human organism.

Morbid Conditions with which Acute Alcoholism may be Confounded. Apoplexy, opium narcosis, concussion of the brain, and even acute pneumonia. The differential diagnosis is impossible to make in the state of deep coma. The pupils are not a trustworthy indication, as in alcoholism they may be either dilated or contracted.

Treatment of Acute Alcoholism. Evacuate the stomach, Ammonia inhalation cautiously, warmth to the extremities, cold affusion to the head, faradism of the muscles of respiration.

Therapeutics. Though decidedly injurious in health, in disease Alcohol is a most valuable agent for appropriate cases. In—

Vomiting of yellow fever, sea-sickness, etc.,—Iced Champagne is useful.

Atonic Indigestion of nervous and depressed subjects,—cautiously, lest the alcohol habit form.

Phthisis,—it does good if it promotes digestion and assimilation; otherwise it is very injurious.

Cholera Infantum, Diarrhœa, etc.,—Cognac Brandy in full doses is generally an efficient agent.

Cardiac Failure,—Brandy in small doses repeated as fast as oxidized.

Chloroform Anæsthesia,— $\frac{3}{4}$ –ij of Whiskey beforehand, to sustain the heart, and prolong the chloroform narcosis.

Poisoning by cardiac depressants and snake-venom,—Alcohol freely, to sustain the heart. In snake poisoning it is given *ad libitum*.

Diphtheria,—Whiskey or Brandy in small doses frequently from the commencement, and dilute Alcohol sprayed into the throat, is very efficient treatment.

Adynamic Fevers,—Small doses frequently are often of great value.

Gonorrhœa,—Niemeyer did a lucrative business by treating this affection with injections of Tannic Acid in Port Wine.

Insomnia from cerebral anæmia,—may be prevented by small doses at bedtime of some alcoholic stimulant.

Delirium Tremens is relieved by small doses of Alcohol with aliment, when due to failure of the stomach to appropriate food.

Wounds,—no better dressing than strong Alcohol, to prevent putrefaction and protect the surface by coating it with a coagulum of its albumen.

Bed Sores if threatening,—Alcohol locally, to harden the tissue.

Colds, from exposure, may be prevented by small doses of Alcohol, to restore the balance of the circulation and prevent internal congestions, by relaxing the vessels of the periphery.

ÆTHER,—Ether.

The substance improperly called “Sulphuric Ether” or “Ether” is Ethylic Ether, or the Oxide of Ethyl, $C_4H_{10}O$. It is a derivative of Ethylic Alcohol, prepared by its distillation with Sulphuric Acid, the latter body dehydrating the Alcohol and remaining in the retort. $(C_2H_5O)_2 - H_2O = C_4H_{10}O$.

Properties. Ether is a volatile, colorless, inflammable liquid, lighter than water; its vapor being heavier than air, and forming therewith a highly explosive mixture. It is a solvent of oils, fats, resins, caoutchouc, gutta percha, and many other substances.

Official Preparations and Chemical Analogues.

Æther, sp. gr. 0.750, contains about 26 per cent. by weight of Alcohol and a little Water.

Æther Fortior, Stronger Ether, sp. gr. 0.725, Ethyl Oxide, $C_4H_{10}O$. Wrongly called "Sulphuric Ether." Contains about 6 per cent. of Alcohol, and a little Water.

Æther Aceticus, Acetic Ether, sp. gr. 0.890, Acetate of Ethyl, $C_4H_8O_2$. Used in making the Spiritus Odoratus, and the Tinctura Ferri Acetatis.

**Sulphuric Ether*, properly so called, Ethyl Sulphate, $C_4H_{10}SO_4$.

**Nitrous Ether*, Ethyl Nitrite, $C_2H_5NO_2$. A solution of this in Alcohol is the well known diuretic and diaphoretic—

Spiritus Ætheris Nitrosi, Sweet Spirit of Nitre, $\mathfrak{m}\mathfrak{v}$ – \mathfrak{z} ij.

Spiritus Ætheris, Spirit of Ether, $\mathfrak{m}\mathfrak{v}$ – \mathfrak{z} j. Ether 30 parts, Alcohol 70.

Spiritus Ætheris Compositus, Hoffman's Anodyne, $\mathfrak{m}\mathfrak{v}$ – \mathfrak{z} j. Alcohol 67, Ether 30, Ethereal Oil 3.

**Anæsthetic Mixtures*,—have Ether 3 parts, Chloroform 2 or 1, Alcohol 1.

Physiological Actions. Ether is anodyne, antispasmodic, diaphoretic, and anthelmintic, a cardiac and cerebral stimulant, an anæsthetic, and a narcotic poison. Administered internally it stimulates the secretions of the stomach, salivary glands, and pancreas. On the cerebrum and the motor and sensory nerves, its action is similar to that of alcohol, but more prompt and less protracted. It is eliminated quickly, chiefly by the lungs.

Inhaled, it produces at first faucial irritation, a sense of strangulation, and cough, then a stage of excitement (cerebral intoxication), in which the face is flushed and the respiration and pulse are quickened. A tetanic convulsive stage generally follows, the face being cyanosed, the muscles rigid, the respiration stertorous. This soon subsides, and complete insensibility is established, the muscles being relaxed, and the reflexes abolished. The cerebral functions are suspended, the lower centres in the medulla continuing to carry on the processes of respiration and circulation. If the inhalation be continued these too become paralyzed, death usually result-

ing from slow paralysis of respiration, the heart pulsating long after breathing has ceased. [Chloroform usually paralyzes the heart.] *Atropine* hypodermically is the best antagonist to the toxic effects of ether.

Nitrous Ether is a mild diaphoretic, a carminative, and a most efficient diuretic.

Therapeutics. When diluted with Alcohol, Ether mixes readily with Water, and may be administered internally in—

Indigestion of Fats, and to aid the digestion of Cod-liver Oil.

Gastralgia, Colic, Flatulence, etc.,—Hoffman's Anodyne is admirable.

Hepatic Colic,—Durande's solvent remedy consists of Ether and Turpentine, and is supposed to dissolve hepatic calculi.

Syncope is promptly met by Hoffman's Anodyne.

Hysteria, the paroxysm and flatulence, are quickly relieved by Ether.

Cholera, the algid state,—Ether has been well used subcutaneously.

Neuralgia,—Ether injected into the vicinity of the affected nerve.

Local Anæsthesia by Ether-spray, affords great relief in neuralgia of superficial nerves, lumbago, spinal irritation, chorea; and in minor surgical operations it is a valuable method, but now displaced by Cocaine.

As an Anæsthetic,—Ether is less prompt in action but much safer than Chloroform, as it rarely paralyzes a healthy heart. It has its necrology, however, some 27 deaths being reported as undoubtedly caused by it, besides several which occurred some hours after the anæsthesia. Ether should be inhaled in as concentrated a form as possible, and will then produce insensibility in 3 to 8 minutes. If a light be in the room it should be high above the patient. A grate-fire or gas stove in the vicinity is very dangerous. [Compare *Chloroform*, pages 91, 92.]

CHLOROFORMUM,—Chloroform.

Chloroform is the Ter-chloride of Methyl, or Methylic Ether, CHCl_3 , prepared by the action of Chlorinated Lime upon Alcohol. It was discovered by Samuel Guthrie, of Sackett's Harbor, N. Y., in 1831.

Properties. It is a colorless, neutral fluid, practically non-inflammable, soluble in alcohol, ether, olive oil and turpentine, and 200 of water. Its density and weight are about four times those of air. It dissolves caoutchouc, gutta percha, oils, fats, resins, many of the balsams, and most of the organic alkaloids.

Preparations.

Chloroformum Venale, Crude Chloroform, sp. gr. at least 1.470. For local use. Contains hydrocarbons, free chlorine, acids, etc.

Chloroformum Purificatum, Purified Chloroform, sp. gr. at least 1.485. $\mathfrak{m}\mathfrak{j}$ – \mathfrak{z} ss, diluted, internally. $\mathfrak{z}\mathfrak{j}$ – $\mathfrak{z}\mathfrak{j}$ by inhalation.

Spiritus Chloroformi, Chloroform 10 parts to 90 of Alcohol. Dose, $\mathfrak{m}\mathfrak{v}$ – $\mathfrak{z}\mathfrak{ij}$ well diluted.

Mistura Chloroformi, $\mathfrak{z}\mathfrak{j}$ – $\mathfrak{z}\mathfrak{j}$. Chloroform 8 parts, Camphor 2, Albumen 10, Water 80.

Linimentum Chloroformi, *Chloroformum Venale* 40 parts, *Linimentum Saponis* 60. An anodyne application for local use.

**Linimentum Chloroformi Compositum*,—Chloroform 1, Oil of Turpentine 1, Laudanum $\frac{1}{2}$, Tinct. Aconite $\frac{1}{4}$, Soap Liniment 2.

**Chlorodyne*, gtt. v–xl. A celebrated secret and very dangerous preparation, supposed to contain Chloroform, Ether, Morphine, Cannabis Indica, Hydrocyanic Acid, Treacle, etc. Samples as sold contain Morphine in various proportions, from gr. $\frac{1}{80}$ –gr. \mathfrak{j} to the \mathfrak{z} .

**Anæsthetic Mixtures*. That of Nussbaum has of Ether 3 parts, Chloroform 1, Alcohol 1. Another, much used, contains of Ether 3 measures, Chloroform 2, Alcohol 1.

Physiological Actions of Chloroform compared with Ether. Chloroform is more irritant to the mucous membranes, and causes violent gastro-enteritis if swallowed undiluted. It is less of a stimulant, and more depressant to the heart and circulation. It clots the blood outside the body, making a mass like sealing-wax. A large dose swallowed has caused death. *Inhaled*, it is much more dangerous than Ether, from its direct paralyzant effect on the heart. Its vapor requires admixture with 96 $\frac{1}{2}$ per cent. (?) of air to produce anæsthesia with safety. Its vapor is less irritant, however, to the air passages, unflammable, more pleasant, more prompt in action, has a shorter stage of excitement and a more profound narcosis, and does not cause so much vomiting. About 500 fatal cases from its inhalation are now reported, none of which were in obstetrical practice. Chloroform mortality is 1 in 3,000; Ether mortality, 1 in 16,000. *Death* from Chloroform inhalation is almost always sudden, and by cardiac paralysis,—from Ether it is slow and usually by paralysis of respiration.

Modes of Dying from Anæsthetic vapors. (1) Death may occur early in the inhalation, from sudden paralysis of the cardiac ganglia. Or by a small quantity of Chloroform given for minor operations the cerebral hemispheres may be paralyzed, but not the basal or medullary ganglia, permitting the irritation of a sensory nerve (especially the 5th) to transmit

reflex inhibition over the pneumogastric upon the heart, thus arresting its ganglia. The state of incomplete anæsthesia is always a dangerous one in which to perform any operation, especially when the 5th nerve is implicated therein.

(2) In the stage of rigidity, from fixation of the respiratory muscles, the blood backing up on the venous side and arresting the heart's action.

(3) In the stage of complete relaxation, by paralysis of respiration; or by paralysis of the tongue, causing obstructed respiration.

(4) In the same stage, by paralysis of the cardiac ganglia.

(5) From depression of the functions, or shock, in the anæsthetic state, or afterwards.

Contra-indications for the use of Anæsthesia. Fatty degeneration or dilatation of the heart, kidney disease, emphysema of the lungs, very enlarged tonsils, tumor of the brain, and chronic alcoholism—particularly the first and last named.

Treatment of Dangerous Symptoms. The vapor should be withdrawn and the patient inverted, head downwards, if cardiac failure occurs. Drawing the tongue forwards, artificial respiration, and faradization of the respiratory muscles, if breathing ceases. Warmth to the body and limbs. *Atropine* by hypodermic injection.

If swallowed, the stomach should be evacuated, and the case treated as one of poisoning by an irritant. There is no *chemical antidote*.

Therapeutics of Chloroform. It is used for the same conditions as Ether, and is much employed locally in liniments, as a rubefacient and anodyne, as in—

Rheumatic and Neuralgic Pains of chronic character,—with Oil of Turpentine or Camphor, in a soap liniment. See Linim. Chlorof. Comp.

Cholera,—the Spirit, or Chlorodyne, has been more efficacious in true cholera than any other single remedy.

Respiratory Neuroses, as hay fever, spasmodic asthma, reflex cough, etc.—the vapor of \mathfrak{zj} of the Spirit inhaled from hot water.

Sciatica, Tic-douloureux and other neuralgiæ of important nerves,—the deep injection of $\mathfrak{m}\text{v}-\text{xv}$ (?) of pure Chloroform into the vicinity of the nerve is most efficient treatment (Bartholow). In my only case it caused dangerous local disturbance (H. C. Wood).

As an Anæsthetic its use is lessening every year in favor of Ether, except in obstetrical practice and for young children. Its vapor being four times denser and heavier than air, and its effective use requiring not

more than $3\frac{1}{2}$ per cent. (?) of Chloroform vapor, its administration requires most careful management. Dr. Sayre ignores the foregoing rule and always shuts off all atmospheric air, claiming a more complete anæsthesia from a very small quantity ($\mathfrak{m}_{\text{xv-xx}}$) of Chloroform.

An ounce of Brandy, and a subcutaneous injection of Morphine, gr. $\frac{1}{5}$ and Atropine, gr. $\frac{1}{20}$, twenty minutes before commencing the inhalation, are means of great utility in sustaining the heart and respiration, and in rendering the anæsthesia more profound.

CARBONEI BISULPHIDUM,—Bisulphide of Carbon.

Properties. Bisulphide of Carbon (CS_2) is a clear, colorless, diffusive, neutral liquid, highly inflammable, vaporizes at ordinary temperatures; insoluble in water, but soluble in alcohol, ether, chloroform, and oils. It is an efficient anæsthetic, but of horribly offensive odor. It may be administered in doses of $\mathfrak{m}_{\text{ss-j}}$, internally.

Physiological Actions. Being largely used in the arts, its effects are often seen in the operative class. Its vapor produces headache, vertigo, emaciation, incoördination of movements, and depression of all the special senses, with impaired sensation and motility. Inhaled, it excites violent coughing, and produces anæsthesia, characterized by muscular rigidity, but it is a powerful cardiac paralyzant, and hence extremely dangerous as an anæsthetic. In doses of gtt. iij it produces severe nausea and vomiting, with a sensation of heat in the stomach, and a rapid and weak heart.

Therapeutics. It may be used in—*Irritable Ulcers*,—as a local application to set up a substitutive inflammation, which replaces the original disease. *Gastralgia*,—doses of \mathfrak{m}_{ss} have been serviceable. *Gastric Cancer*,—it alleviates the pain. *Nausea and Vomiting* are relieved by \mathfrak{m}_{ss} doses.

CHLORAL-HYDRATE AND CROTON-CHLORAL.

Chloral itself is Tri-chloroacetyl-hydride, $\text{C}_2\text{HCl}_3\text{O}$, an unstable, oily, colorless fluid, formed by the action of Chlorine upon Alcohol. Its hydrate, the official "Chloral," $\text{C}_2\text{HCl}_3\text{O}$, H_2O , is a white crystalline solid, soluble in Alcohol, Water, and Glycerin, and is decomposed by alkalies into Chloroform and a Formate of the alkaline base. Its dose is gr. ij-xx or more, but poisonous symptoms have followed the administration of gr. xxx, and in one case after only gr. vijss. When tolerance has been established by habitual use, as much as \mathfrak{z} iij have been taken daily, for months.

Croton-chloral is Butyl-chloral-hydrate, or Croton-chloral-hydrate, $C_4H_5Cl_3O$, H_2O , a crystalline body formed by the action of Chlorine gas upon Aldehyde, and sparingly soluble in water. In action it is similar to Chloral, but feebler. It has specific action on the fifth nerve, causing anæsthesia of the head. Dose, gr. v-xx, in pill.

Physiological Actions of Chloral. It is essentially an hypnotic, a depressor of the cerebro-spinal centres, antispasmodic, antiseptic, antiferment, counter-irritant, and prevents the coagulation of fibrin. It is more hypnotic than Chloroform, and less anæsthetic.

The taste of Chloral is hot and pungent; if used in large doses or in strong solutions it may excite gastritis, with nausea and vomiting. After a brief period of stimulation it depresses the heart and arterial tension, diminishes oxidation, and lowers the body temperature. On the brain it has a selective action; by inducing cerebral anæmia it produces a deep sopor, very like normal sleep, from which the patient may be awakened, but immediately falls asleep again, and is not followed by headache or depression. In some persons instead of sleep it causes headache, insomnia and delirious excitement. It is not an anodyne, as it does not affect the conductivity of the sensory nerves, and does not interrupt the transmission of pain, but by overwhelming the centres prevents the consciousness of pain, and is, therefore, only indirectly an anæsthetic.

A Large Dose produces profound narcotism, abolishment of the reflexes and of sensibility, and complete muscular relaxation, with a great fall of temperature. Death may result in the chloral sleep, from paralysis of the cardiac motor ganglia and the respiratory centre, or by sudden failure of the heart in cases of fatty degeneration, or in old drunkards.

The Chloral Habit. Chloralism is a state of marked anæmia, its subjects presenting a weak, irritable, often irregular heart, deranged liver function, jaundice, bileless stools, perhaps purpura and sloughing of a finger, from decreased blood supply. Its votaries are on the border of insanity, excitable, uncontrollable in speech and action, talking in a silly manner and very volubly. Many cases of insanity result from the chloral habit.

Action of Chloral on the Blood. It diffuses rapidly into the blood which, being an alkaline fluid, partially decomposes it, setting Chloroform free (?). It crenates the red corpuscles, and in large quantities destroys the leucocytes. It increases the fluidity of the blood, producing an anæmic condition. It is excreted by the kidneys, partly unchanged, but chiefly as Uro-chloralic Acid, producing some diuresis;—also by the skin, causing various eruptions if long used.

Toxicology of Chloral. *Atropine* antagonizes its cardiac, respiratory and spinal depression, and should be given in small doses, frequently repeated, until its effects are apparent. *Morphine* given with chloral prevents the tendency to cardiac failure, while synergistic to its hypnotism. *Chloral* is the antagonist to *Strychnine*, opposing the spinal action of that drug, but the reverse is only true to a limited extent. Chloral and *Atropine*, though antagonistic in their actions upon the spinal cord, both produce motor paralysis,—the former by paralyzing the cord, the latter by paralyzing the motor nerves.

Therapeutics. Chloral is of great value as an hypnotic and antispasmodic, but must be cautiously used, if at all, in old drunkards or persons with weak or fatty hearts, atheromatous vessels, or advanced pulmonary disease. In combination with Potassium Bromide it is much used in asylum practice, and much abused; both drugs are cardiac poisons. It should never be given internally to relieve pain, but it is highly serviceable in—

Neuralgia,—if triturated with Camphor and applied locally.

Sea-sickness,—gr. v. two or three times a day is generally very efficient.

Cholera in the algid stage, and in violent cases of cholera morbus,—gr. xv hypodermically every hour, of extraordinary efficacy.

Fevers, when high temperature, excitement, restlessness, and sthenic condition,—Chloral lowers the temperature, prevents the coagulation of fibrin, and is frequently of great utility.

Diphtheria,—Chloral in the first stage, but not if weak heart.

Obstetrics,—it is used to alleviate suffering, to relax the os uteri, to palliate puerperal convulsions, and to relieve after-pains.

Delirium Tremens,—Chloral has been too much used. It produces the best sleep in this condition, but is dangerous to old drunkards.

Tetanus,—the best treatment is by Chloral and Potassium Bromide.

Cancers and Ulcers,—a 25 per cent. solution locally, as an antiseptic and anodyne application.

Tic-douloureux,—Croton-chloral is an efficient palliative, given in 5-grain doses every half hour, up to gr. xxx.

Epilepsy,—for nocturnal attacks give Chloral in a full dose, at bedtime.

Strychnine Poisoning,—Chloral is the antagonist *par excellence*.

OPIUM,—Opium.

Nature and Source. The concrete, milky exudation, obtained in Asia Minor by incising the unripe capsules of *Papaver somniferum*, the white Poppy plant. In its normal, moist condition, it should yield not less than 9 per cent. of Morphine, when assayed by the official process. It contains 17 alkaloids, 2 neutral bodies, 2 organic acids,—also wax, gum, sugar, resin, extractives, odorous principles, etc. The six principal alkaloids of Opium are—

Morphina, Morphine, gr. $\frac{1}{20}$ — $\frac{1}{2}$;—hypnotic, anodyne and narcotic.

Codeina, Codeine, gr. $\frac{1}{5}$ —j;—calmative, and less constipating.

**Thebaina*, Thebaine,—a tetanizer; not used medicinally.

**Narceina*, Narceine, gr. $\frac{1}{8}$ — $\frac{1}{2}$;—probably the most hypnotic of the six.

**Papaverina*, Papaverine;—action doubtful, narcotic and convulsant (?).

**Narcotina*, Narcotine, gr. j—v;—wrongly named, having no narcotic action; is a tetanizer and highly antiperiodic.

Derivative of Morphine, obtained by the action of HCl acid, is—

Apomorphina, Apomorphine,—an artificial alkaloid and a powerful emetic; the *Hydrochlorate* of which is official, and may be administered in doses of gr. $\frac{1}{8}$ by stomach, or gr. $\frac{1}{16}$ hypodermically. (See page 129.)

These principles are combined in the plant with *Meconic* and *Lactic Acids*.

Preparations.

Pulvis Opii, Powdered Opium. Dose, gr. $\frac{1}{4}$ —ij;—a medium dose being about gr. j.

Opium Denarcotisatum, Denarcotized Opium. Dose, gr. $\frac{1}{4}$ —ij.

Extractum Opii,—an aqueous extract, containing Glycerin. Dose, gr. $\frac{1}{4}$ —j.

Tinctura Opii, Laudanum,—℥xj or gtt. xxij about equal gr. j of Opium.

Tinctura Opii Deodorata,—℥xj or gtt. xv about equal gr. j of Opium.

Vinum Opii, Sydenham's Laudanum,—℥xj or gtt. xvij about = gr. j.

Acetum Opii, Black Drop,—℥xj or gtt. xvj about = gr. j of Opium.

Tinctura Opii Camphorata, Paregoric,—℥ss contains nearly gr. j.

**Liquor Opii Compositus* (Squibb),—℥xj or gtt. xxij about = gr. j.

**Tinctura Opii Composita*, Squibb's Diarrhœa Mixture,—has of Tinct. Opii, Tinct. Capsici, Spt. Camphoræ, āā ℥j, Chloroformi Purif., ℥ij, Alcoholis Fort., ad ℥v. Dose, for infants, gtt. j—x; for children, gtt. x—xxx; for adults, ℥j.

Emplastrum Opii,—Ext. of Opium, Burgundy Pitch and Lead Plaster.

Pilula Opii,—each pill has gr. j of Opium with gr. $\frac{1}{4}$ of Soap.

Pulvis Ipecacuanhæ et Opii, Dover's Powder,—Ipecac. i, Opium i, Sugar of Milk 8 parts, triturated to a fine powder. Dose, gr. v—xv.

Tinctura Ipecacuanhæ et Opii, to represent Dover's Powder in a liquid

form;—Tr. Opii Deod. 10 parts evaporated to $8\frac{1}{2}$, Fl. Ext. Ipecac. i, Dil. Alcohol *ad* 10. Dose, $\mathfrak{m}_{\text{v-xv}}$.

Trochisci Glycyrrhizæ et Opii,—each troche has gr. $\frac{1}{30}$ of Ext. Opii.

Morphina, Morphine,—Average dose gr. $\frac{1}{4}$ – $\frac{1}{6}$, which about equals gr. j of Opium of medium Morphine strength.

Morphinæ Acetas,—soluble in 12 of water. Dose, gr. $\frac{1}{20}$ –gr. j.

Morphinæ Hydrochloras,—soluble in 24 of water. Dose, gr. $\frac{1}{20}$ –gr. j.

Morphinæ Sulphas,—soluble in 24 of water, contains about 80 per cent. of Morphine. Dose, gr. $\frac{1}{20}$ –gr. j, a medium adult dose being gr. $\frac{1}{6}$.

Pulvis Morphinæ Compositus, Tully's Powder,—gr. x contain gr. $\frac{1}{6}$ of Morphine Sulphate, with Camphor, Liquorice and Calcium Carbonate.

**Liquor Morphinæ Sulphatis*, Magendie's Solution,—has gr. xvj of Morphine Sulphate in $\frac{3}{4}$ j of Distilled Water, or gr. $\frac{1}{4}$ in $\mathfrak{m}_{\text{vijss}}$.

**Liquor Morphinæ Sulphatis*, U. S. P., 1870,—has gr. j of Morphine Sulphate to the $\frac{3}{4}$ of Distilled Water. Dose, $\mathfrak{m}_{\text{xxx}}$ – $\frac{3}{4}$ ss.

Codeina, Codeine,—soluble in 80 of water. Dose, gr. $\frac{1}{4}$ –gr. ij; but gr. $\frac{1}{6}$ has produced alarming symptoms in children.

U. S. Phar. 1880, Changes in Opium Preparations. The official dried Opium should now contain 12 to 16 per cent. of Morphine, instead of 10 per cent., as required by the Phar. of 1870. The liquid preparations, except Paregoric, are required to be of the uniform Opium strength of 10 per cent. by weight, making the Wine 2 per cent. weaker, the Acetum $\frac{1}{3}$ weaker, and the others $\frac{1}{2}$ stronger in Morphine than formerly. So that, if the former full anodyne dose of Tincture be taken at $\mathfrak{m}_{\text{xxiv}}$, = gr. $\frac{1}{4}$ of Morph. Sulph., the corresponding dose under the new system will be $\mathfrak{m}_{\text{xvj}}$.

Tests for Morphine. *Nitric Acid* produces a blood red, turning orange, then yellow, then disappearing, *Ferric Chloride* gives a rich blue with Morphine, a dark brown with Meconic Acid or any preparation of Opium. *Iodic Acid* liberates Iodine, which may be tested by starch.

Minimum Fatal dose of Opium. In a child one day old \mathfrak{m}_{j} of Laudanum was fatal; and in another aged nine months a few drops of Paregoric caused death. In the adult gr. $\frac{1}{6}$ of Morphine, or gr. iv of crude Opium have proved fatal.

Treatment of Opium Poisoning. The chief indications are—to evacuate the stomach, maintain respiration, and keep up the circulation. *Atropine* antagonizes its cerebral action, also its action on the pupil, respiration, heart and arterial tension; but if given too freely will endanger the case by substituting Belladonna narcosis for Opium narcosis. Gr. $\frac{1}{120}$, hypodermically, every 15 minutes, for three doses, is generally sufficient. *Coffee* and *Caffeine* are also physiologically antagonistic to Opium. *Fara-*

dization of the chest muscles, cold affusion and artificial respiration are of great value. *Flagellation* is a very dangerous procedure, from the exhaustion produced; strong faradic currents are much more efficient. *Evacuation of the bladder* is important, to prevent reabsorption.

Physiological Actions. Opium is analgesic, hypnotic, diaphoretic, antispasmodic, narcotic, also a cardiac and respiratory depressant, after brief stimulation thereof.

In Medium Doses (gr. j), it dries all the secretions, except those of the breasts and the skin, the latter being increased; produces dryness of the mouth and throat, arrest of the gastric secretion, retarded digestion and anorexia; stimulates the brain by increasing the blood supply; and does not affect the conductivity of the nerves. The action of the heart is increased, and the arterial tension raised; the pupil slightly contracted; the mind, at first stimulated, becomes calm; sleep follows, disturbed by dreams; and headache, constipation and some depression result.

In Full Doses (gr. v), it arrests digestion; causes nausea and vomiting; greatly increases the sweat; prevents the conductivity of the nerves; depresses the heart and circulation, impairing oxidation and lowering temperature; contracts the pupil by stimulating the motor oculi; causes intense pruritus, especially of the nose; often retention of urine; and soon profound sopor (in some cases coma-vigil, delirium); leaving as after-effects nausea, depression, constipation, vertigo, anorexia, nasal pruritus, fetid pathological secretions.

A Toxic Dose produces cold, clammy sweat, very slow heart, abolished reflexes, coma; the pupil minutely contracted, but dilated as the end approaches; and death by suspension of respiration, due to the direct action of the poison on the respiratory centres in the medulla.

Post-mortem shows only a wet brain, congested lungs, and engorgement of the venous trunks and the right side of the heart.

Actions of Morphine as compared with those of Opium. Morphine causes more intense pruritus, and is more anodyne and hypnotic. It is less stimulating, less convulsant, less constipating and less diaphoretic.

Therapeutics. The chief indications for the use of Opium are—(1) to relieve pain; (2) to produce sleep; (3) to allay irritation; (4) to check excessive secretions; (5) to support the system; (6) as a sudorific. It is badly borne usually by women and children, and in some persons great nausea and depression follow its use, which may usually be averted by the conjoined administration of Potassium Bromide or Hydrobromic Acid with each dose of the opiate used. It is especially valuable in—
Pain from any cause except acute inflammation of the brain.

Low Fevers when insomnia and low muttering delirium, and to support the system when sufficient food cannot be taken or retained.

Irritation of the bronchi, bladder, stomach, as in acute severe vomiting.

Peritonitis,—used freely, even to narcotism, it has often saved life.

Diarrhœa, *Dysentery*, *Enteritis*, etc.,—it is a very efficient remedy.

Diabetes, both insipidus and mellitus, in the former with Gallic Acid.

Acute Uræmia,—Loomis urges its use to control convulsions and promote diuresis; large doses required.

Colds and Muscular Rheumatism,—Dover's powder as a diaphoretic, conjoined with hot drinks and hot foot-baths.

Gastralgia,—no remedy equal to Morphine and Bismuth Subnitrate.

Colic,—rectal suppositories containing the Aqueous Extract of Opium.

Spasm,—Morphine hypodermically in muscular spasm.

Cholera Morbus and Dysentery,—gr. $\frac{1}{2}$ of Morphine with gr. $\frac{1}{120}$ of Atropine, promptly effective after the ingesta have been removed by an active cathartic.

Serous Inflammation,—the Deodorized Tincture to slight narcotism.

Cerebro-spinal Meningitis,—Opium the one remedy if given early, before exudation has set in.

Superficial Inflammations,—Opium or Morphine locally, of great value.

HUMULUS,—Hops.

Source and Composition. The strobiles (fruit-cones) of *Humulus Lupulus*, the hop vine. *Lupulin* (*Lupulinum*) is the yellow powder of the strobiles. It contains an Essential Oil which consists of *Valerol* and *Trimethylamine*; as well as a liquid volatile Alkaloid, named *Lupuline*; a narcotic alkaloid named *Hopeine*, also *Lupulinic Acid* and a resin.

Preparations.

Tinctura Humuli, 3 ss-ij. **Infusum Humuli*, a teacupful or more.

Extractum Lupulini Fluidum, 3 ss-ij. *Oleoresina Lupulini*, gr. ij-gr. v.

Physiological Actions. Humulus is a bitter tonic, a feeble hypnotic, also diaphoretic, anaphrodisiac and astringent. It increases the cardiac action and the cutaneous circulation. After slight cerebral excitement it produces calm, and a soporific disposition.

Therapeutics. It is used as a tonic and calmative in—

Delirium Tremens of mild form,—a Tincture of Lupulin with that of Capsicum is very efficient, and an excellent substitute for Alcohol.

Dyspepsia, of atonic form—Humulus is a very serviceable remedy.

Inflammation,— a hop poultice is a favorite domestic application.

Nervous Irritability,—The Fluid Extract of Lupulin as a calmative and hypnotic; or the Hop pillow, which exercises considerable influence.

LACTUCARIUM,—Lettuce.

Source and Composition. The concrete juice of *Lactuca virosa*, the acrid lettuce. It contains *Lactucin*, a bitter principle; *Lactucerin*, a neutral substance; *Lactucic Acid*, and other unimportant substances.

Preparations.

Extr. Lactucarii Fluidum, ℥x-℥j. *Syrûpus Lactucarii*, ℥j-℥j.

Physiological Actions. Lactucarium is feebly hypnotic, sedative and diuretic. It is supposed to act similarly to Opium, but much more feebly, and without depressing after-symptoms.

Therapeutics. It is used as a substitute for Opium and as a remedy for cough. The syrup is best employed as a vehicle for more active agents of the same class.

BROMINE,—BROMIDES.

Preparations.

Bromum, Bromine, only used by inhalation, and as an escharotic.

Acidum Hydrobromicum Dilutum, proposed instead of the Bromides.

Fothergill gives it in a cough mixture. Dose, ℥x-℥ij.

Potassii Bromidum, gr. v-℥j.

Ammonii Bromidum, gr. v-xx.

Sodii Bromidum, gr. v-℥j.

Calcii Bromidum, gr. v-℥j.

Lithii Bromidum, gr. v-xx.

Zinci Bromidum, gr. ss-gr. ij.

Physiological Actions of Bromine. It is an active and painful escharotic, a deodorant and an antiseptic, setting free ozone. Internally, it is a corrosive poison, producing violent gastritis, depression and collapse. Its vapor is highly irritant to the respiratory mucous membrane.

Physiological Actions of the Bromides. They are cerebral and spinal depressants, also alterative, antispasmodic and hypnotic. The Potassium salt is especially a cardiac and muscular paralyzant.

The Bromides have a saline taste, and are very diffusible, but slowly eliminated. They are decomposed in the blood, and reformed at the points of elimination (fauces, bronchi, intestines, skin and kidneys), where they irritate the mucous membranes. Continued for some time, they produce severe gastric catarrh. They reduce the number of the respirations, and the heart's action and force; and though diminishing the calibre of the arterioles, they lower arterial tension. They produce somnolence by lessening the activity of the brain cells, diminish the sensibility of the

peripheral nerves, causing anæsthesia of the skin and mucous membranes, impair motility and the sexual function. They cause great pallor, emaciation, lowered body temperature, acne on the face and upper extremities, fetid breath, dysphagia, sluggish reflexes, defective coördination; and if long continued may even impair the mental faculties, producing melancholia with suicidal tendency, and paralysis, beginning at the periphery and extending to the centres.

The general result of their action is termed "Bromism," and is heralded by the acne and lowered faucial sensibility. It is probably due to the sedative influence of these agents on the sympathetic system, causing general anæmia of the brain, spinal cord, sexual organs, and skin.

Differences in Action between the several Bromides.

Potassium Bromide is the most toxic to the heart and the muscular system, and is the least hypnotic. It contains 66 per cent. of Bromine.

Sodium Bromide is the least toxic, but the most hypnotic, and acts most energetically on the circulation. It contains 78 per cent. of Bromine.

Ammonium Bromide resembles the Potassium salt in action, except that it exerts less influence on the heart and muscular system, and is somewhat more stimulating.

Lithium Bromide contains the most Bromide (92 per cent.), and resembles the Sodium salt in action. It has proved better than the others in some cases of epilepsy, and is considered the best hypnotic of the series.

Calcium Bromide is an efficient hypnotic, but otherwise not very active.

Bromide of Zinc produces effects generally similar to those of the other bromides, but in large doses is violently irritant.

Therapeutics. The Bromides are used as sedatives to the nervous system, to lower reflex activity, to produce sleep and to subdue excitement of the genital apparatus. They should not be used in anæmic conditions. The combination of Potassium Bromide with Chloral is very unsafe in cases where fatty or weak heart exists, both drugs being active cardiac depressants. In—

Convulsive and Spasmodic Affections,—the Bromides are very efficient.

Epilepsy, especially diurnal seizures, the Bromide of Sodium in sufficient quantity to maintain anæsthesia of the fauces, for three or four years. Purgation occasionally, to prevent its accumulation in the system, and Arsenic to antagonize the acne.

Diabetes,—the Bromide of Ammonium in cases of nervous origin, has proved curative when long used, by its sedative influence on the medulla oblongata.

Acute Rheumatism,—the Bromide of Ammonium is an excellent alkali.

Muscular Rheumatism,—the Lithium salt gives very good results.

Nervous Erethism,—the Bromides are much used, and with good effect.

Insomnia with congestion, as from cerebral overwork.

Infantile Colic,—the Bromide of Potassium, in five-grain doses, with a little Oil of Anise, is considered excellent.

Cholera Infantum,—the Bromides check the vomiting and purging.

Vomiting of cerebral origin,—they are extremely useful.

Cardiac Irritability, when not due to anæmia, is calmed by the Bromides.

Delirium Tremens. In the preceding "horrors," drachm doses of the Potassium salt every four to six hours, are often very efficient.

Melancholia,—occasionally the Bromides give great relief.

Whooping-cough, and other reflex coughs,—the Bromides as palliatives.

Seminal Losses, if plethora exists,—are well treated by Bromides.

Nymphomania, these agents have almost a unique power.

Tetanus,—Potassium Bromide is antagonistic in large doses.

Subinvolution of the Womb, and Menorrhagia,—the Potassium salt is considered to have specific power thereon.

Therapeutics of Bromine. It is not much used. In—

Chancre, Hospital Gangrene, etc.,—Bromine locally is the best escharotic.

Diphtheria and Membranous Croup,—a solution containing 8 drops to the \mathfrak{z} , used internally, and inhalations of the vapor, have been used successfully in the most severe cases.

CONÍUM,—Hemlock.

Source and Composition. The full-grown fruit of *Conium maculatum* (spotted Hemlock), gathered while green. It contains a liquid, volatile alkaloid, *Conine* ($C_8H_{15}N$), which resembles Ammonia;—a solid volatile alkaloid;—*Conhydrine*;—also *Methyl-conine*, a Volatile Oil, and *Coniic Acid*.

Preparations. The Extracts are usually inert.

Abstractum Conii, gr. ss–iij. *Extractum Conii Alcoholicum*, gr. j–v.

Tinctura Conii, $\mathfrak{m}\text{x}$ – $\mathfrak{z}\text{j}$. *Extractum Conii Fluidum*, $\mathfrak{m}\text{j}$ –v, if good.

**Conina*, Conine, $\mathfrak{m}_{\frac{1}{10}}$ -iij, or gr. $\frac{1}{60}$ - $\frac{1}{10}$. When given hypodermically, it must be neutralized by acetic acid, as shown by the use of litmus paper; or the hydrobromate in solution, gr. viij ad \mathfrak{z} j; of this $\mathfrak{m}_x =$ gr. $\frac{1}{6}$. This salt may be used in doses of gr. $\frac{1}{12}$ -gr. j, as it is not actively toxic.

Physiological Antagonists. *Nux Vomica* and its alkaloids, *Picrotoxin*, and other tetanizers. Active exercise will hinder its toxic action.

Physiological Actions. Conium is a gastric irritant, producing nausea and vomiting. Its main action is that of a paralyzant to the motor nervous system, beginning at the peripheral end-organs and extending upwards, involving the nerve trunks, and finally the centres. *Methyl-conine* acts similarly but reversely, affecting the centres first. Conium also blunts the common sensibility. Its prominent symptoms are—numbness and weakness of the legs, drooping eyelids, diplopia, slightly dilated pupils, vertigo, impaired utterance, slow and labored breathing, and death by paralysis of the muscles of respiration. The heart is not affected; and the mind is clear until CO_2 narcosis sets in, but is torpid and indifferent.

Socrates was poisoned by the juice of Conium, which was the state poison of the Athenians.

Therapeutics. Conium is used as a sedative to pain and excessive motility. Large doses are required, as some physiological action is necessary. Children bear it well. In—

Chorea, it palliates by depressing the motor nervous system.

Whooping-cough and other spasmodic affections,—it is useful.

Acute Mania,—to quiet motor excitement and prevent exhaustion. Conine, \mathfrak{m}_{ss} -iij, or hypodermically, $\mathfrak{m}_{\frac{1}{10}}$, increased until some physiological effects are produced. Morphine given conjointly acts well.

Pain and Spasm coexisting,—are well met by Conium.

Cancer,—Conium is used locally and internally, to relieve the pain.

Tetanus,—for its sedative action, Conium has been much used.

Blepharospasm is relieved by it.

GELSEMIUM,—Yellow Jasmine.

Source and Composition. The rhizome and rootlets of *Gelsemium sempervirens*, a climbing plant of the Southern States. It contains an alkaloid, *Gelsemine*, in combination with Gelsemic Acid, also a volatile oil, and a resin. Dose, gr. ij-xx.

Preparations. Only two are official, viz.—

Tinctura Gelsemii, \mathfrak{m}_v -xxx. *Extractum Gelsemii Fluidum*, \mathfrak{m}_{ij} -xx.

**Gelsemina*, Gelsemine, with acids forms soluble salts; gr. $\frac{1}{60}$ – $\frac{1}{20}$.

Antagonists. *Opium* is the antagonist. Artificial respiration and faradism of the muscles of respiration are measures of prime importance in poisoning by this drug.

Physiological Actions. Gelsemium is an antispasmodic, a diaphoretic and nervous depressant, paralyzing motility and sensibility by central action on the spinal cord. It is also anaphrodisiac.

In Moderate Doses it causes languor, slowing of the cardiac rate, feebleness of muscular action, impaired sensibility, drooping eyelids and dilated pupils, with some diaphoresis.

A Toxic Dose (a teaspoonful of the fluid extract) produces vertigo, diplopia, drooped eyelids, dilated pupils (paralysis of 3d nerve), labored breathing, slow and feeble heart, dropped jaw, staggering gait, great muscular weakness and almost complete general anæsthesia, profuse sweats, loss of articulation, and death by asphyxia (paralysis of muscles of respiration). Consciousness is preserved until CO_2 narcosis sets in. Convulsions do not occur in man, but do in lower animals, the convulsive movements being backward. Motion is affected before sensibility in warm-blooded animals, sensibility before motion in frogs.

Gelsemium, though it lowers the heart rate, is not an arterial depressant, and does not irritate the gastro-intestinal tract. The effects of a moderate dose pass off in about three hours. It produces a decided lowering of the body temperature.

Therapeutics. Gelsemium is indicated in all conditions of exalted nerve function, and contra-indicated whenever there is weak heart. It is well used in—

Cerebro-spinal Meningitis,— \mathfrak{m}_v of the fluid extract every 2 hours.

Mania, with great motor excitement and persistent insomnia.

Delirium Tremens, and many forms of *Insomnia*,—it is very efficient.

Pneumonia and Pleuritis,— \mathfrak{m}_v -x of the fluid extract every 2 hours, to maintain a physiological effect, give excellent results. If the heart be weak this remedy must not be used.

Cough of convulsive or spasmodic character,—it is useful.

Neuralgia of the 5th Nerve has been successfully treated by Gelsemium.

Remittent Fever,—it usually exercises a very beneficial influence.

After-pains are frequently suspended by moderate doses.

Ovarian Neuralgia,—there is no better remedy, in full doses.

Dysmenorrhœa,—Gelsemium often greatly alleviates the pain.

Irritable Bladder of women, and incontinence of urine from spasm of the vesical muscular fibres,—this remedy is often very efficient.

*CURARE,—Woorara.

Source and Composition. Curare is a vegetable extract, obtained from various plants (*Strychnos toxifera*, *Paullinia curara*, etc.), and used in S. America as an arrow poison. Its active principle is the alkaloid *Curarine*, which contains no oxygen.

Preparations. There are none official.

**Curare*, gr. $\frac{1}{10}$ hypodermically; or ℥x-xv of a solution of gr. j in ℥ij.

**Curarina*, Curarine, gr. $\frac{1}{200}$ hypodermically, gr. $\frac{1}{50}$ by stomach.

**Caroval*, *Vao*,—are names of native preparations.

Physiological Actions. Curare paralyzes the end organs of the motor nerves, but does not at first act directly on the brain or spinal cord; though if life be prolonged by artificial respiration, the cord, sensory nerves, and even the muscular tissues become implicated. The limbs are paralyzed first, death occurring by paralysis of respiration. The heart, at first quickened, becomes depressed, the blood pressure lowered, the eyelids droop, the eyeballs protrude, vision is disordered, intestinal peristalsis and sensibility to stimuli are greatly increased, and an artificial glycosuria (curare-diabetes) is set up.

The absorption of Curare by the stomach is very slow, but its elimination which takes place by the kidneys, is more rapid and complete than that of any other alkaloid. The urine of a curarized animal will poison another, and that of the second will paralyze a third.

Actions of Curare, Conine and Gelsemine. Curare and Conine paralyze the end organs of the motor nerves, Gelsemine and Methyl-Conine paralyze the motor centres.

Antagonists. Artificial respiration, to maintain life until elimination occurs. Evacuation of the bladder repeatedly is an important measure. *Strychnine*, though from a member of the same family, is antagonistic as to the effects on the heart and respiration.

Therapeutics. Curare is effective in—

Tetanus, both idiopathic and traumatic,—injections of gr. $\frac{1}{6}$ – $\frac{1}{2}$, repeated hypodermically, have proved curative in many cases. In *Hydrophobia*, *Epilepsy* and *Chorea* it has apparently effected cures.

PILOCARPUS,—Jaborandi.

Source and Composition. The leaflets of *Pilocarpus pennatifolius*, a Brazilian plant of the rue family. It contains 2 alkaloids, *Pilocarpine* and *Jaborine*, which though isomeric are antagonistic in action;—also a volatile oil and probably a peculiar acid.

Preparations.

Extractum Pilocarpi Fluidum, m℥v—ʒj. Generally inert.

Pilocarpinæ Hydrochloras, gr. $\frac{1}{8}$ — $\frac{1}{2}$. Hypodermically, gr. $\frac{1}{8}$.

Physiological Actions. *Pilocarpus* is a paralyzer of the vaso-motor system, a powerful diaphoretic and emetic, and under some circumstances abortifacient. Its taste is hot and pungent. It causes prompt and profuse perspiration (ʒix—xv, in quantity) and salivation (ʒx—xxvij), after a preliminary flushing of the skin. The nasal, bronchial and lachrymal secretions are much increased; sometimes watery diarrhoea occurs; the action of the heart, at first increased, is afterwards lowered, the arterial tension is reduced, and the temperature falls from 1° to 4°. Drowsiness, pallor, chilliness and debility succeed, and last several hours; the pupil is contracted and accommodation impaired. The elimination of urea is greatly increased, but not the quantity of urine. The respiratory power is lowered, and apnoea may occur, from increase of the bronchial mucus.

Pilocarpus is rapidly diffused, and is eliminated by the skin and the salivary glands. Its effects pass off usually in from three to six hours. Children are less affected than adults, by proportionate doses.

Physiological Antagonist. *Atropine*, in dose of gr. $\frac{1}{100}$ for gr. $\frac{1}{8}$ of *Pilocarpine*; its antagonism is very complete throughout the whole range of action. Conversely *Pilocarpine* is exactly antagonistic to *Atropine*, but *Jaborine* acts similarly to the latter drug.

Therapeutics. *Pilocarpus* is well used in—

Ptyalism—a minute dose of *Pilocarpine* (gr. $\frac{1}{30}$) acting on the same gland will antagonize the morbid action and relieve the excessive secretion (Bartholow, Piffard). *Perspiration* of profuse character is checked by gr. $\frac{1}{20}$ of *Pilocarpine* given thrice daily (Ringer).

Diphtheria and *Erysipelas*,—are diseases in which it has proved very efficient, but in which its depressant action on the heart must be remembered.

Amblyopia from alcohol and tobacco, keratitis, choroiditis, chronic iritis, detached retina, and many other eye affections,—*Pilocarpus* is very beneficial.

Pleuritis, Meningitis and other inflammations of serous membranes,—it is remarkably efficient to remove exudations.

Dropsy is its chief field of action, especially renal dropsy; but it is contra-indicated when the heart is weak from any cause.

Diabetes Insipidus,—it reduces the quantity of urine remarkably, relieving the kidneys by throwing the work on the skin.

Agalactia,—*Pilocarpus* promptly stimulates the secretion of milk.

Uræmia, and Puerperal Eclampsia of renal origin,—it has been used with marked success. *Parotitis* is promptly relieved by it.

Bright's Disease,—*Pilocarpine* has been used with great advantage in both the acute and chronic forms, but is so depressing that it must be employed with extreme caution in this disorder.

*MUSCARINA,—Muscarine.

Source and Composition. It is an active toxic alkaloid of syrupy consistence, from *Agaricus muscarius*, or *Amanita muscaria*, the fly-agaric, a poisonous mushroom, used in Kamschatka as an intoxicant. The alkaloid is freely dissolved out by water and dilute acetic acid, so that a doubtful fungus may be easily rendered innocuous.

**Muscarina*, Muscarine, gr. $\frac{1}{8}$ —ij. **Muscarinæ Nitras*, gr. $\frac{1}{10}$ — $\frac{3}{4}$.

Physiological Actions. Muscarine is a powerful respiratory and cardiac depressant, paralyzing the respiratory centre, and arresting the heart in diastole by paralyzing its motor ganglia while stimulating its inhibitory apparatus. It lowers the arterial tension, produces profuse salivation and sweating; contracts the pulmonary vessels, causing intense dyspnoea; and increases the intestinal, hepatic and pancreatic secretions, but markedly diminishes the renal. It disturbs the gastro-intestinal tract, causing severe colic, vomiting and purging. It produces spasm of the accommodation, marked myosis, and contraction of the pupil when given internally, but dilates the pupil widely when locally applied. (*Gelsemium* does so also.) Under its action the body-temperature is decidedly reduced, and the excretion of waste products lessened.

On the cerebrum *Agaricus* acts as an intoxicant, producing more vertigo and delirium than Alcohol, followed by profound sopor with lowered reflexes, perhaps coma and death.

Physiological Antagonist. *Atropine* exactly opposes Muscarine, and *vice versâ*; no example of physiological antagonism being so complete in all particulars. When a frog's heart is arrested by the topical

action of a minute quantity of Muscarine, the application of a little Atropine will immediately restore the pulsations (Ringer). An equally prompt antagonism runs through their entire spheres of action.

Therapeutics. Clinical experience with Muscarine is wanting. It has been used with considerable benefit in—

Night-sweats of Phthisis,—in which it is found extremely efficient.

Chorea,—Agaricus has proven a potent remedy in the idiopathic form.

Ataxic Typhus, with great restlessness and tremor, the tincture of Agaricus in drop-doses has often been effectively employed.

Chilblains have been cured by the same preparation, locally applied.

Inflammations characterized by copious exudation,—Muscarine promises to be of great service, especially in *Eye Inflammations* with exudation,—as it permits of the contraction or dilatation of the pupil at will, according as it is used internally or locally.

Constipation due to torpor of the intestines and deficient secretion, accompanied by a torpid liver and difficult digestion of fats,—Muscarine is exactly indicated in doses of gr. $\frac{1}{80}$ thrice daily.

Catarrhal Jaundice, and *Diabetes* of both forms,—are conditions in which Muscarine promises to be of especial service.

PHYSOSTIGMA,—Calabar Bean.

Source and Composition. The seeds of *Physostigma venenosum*, a woody creeper of Calabar, West Africa, where it is used by the natives as an ordeal for witches, etc. It contains an alkaloid, which is variously named *Eserine*, *Calabarine* and *Physostigmine*,—also albuminous matters, starch and oil.

Preparations.

Tinctura Physostigmatis, M_v—xx. *Extractum Physostigmatis*, gr. $\frac{1}{6}$ —j.

Physostigminæ Salicylas, Salicylate of Physostigmine, gr. $\frac{1}{100}$ — $\frac{1}{60}$.

**Eserina*, Eserine, or its salts, gr. $\frac{1}{80}$ — $\frac{1}{12}$, hypodermically, or by the stomach.

Medicated disks of gelatin are used locally on the eye.

Physiological Actions. Physostigma is a direct spinal paralyzer, producing complete general paralysis, and abolishment of the reflexes, but does not affect muscular irritability or the cerebrum. It stimulates secretion, excites nausea and vomiting; and is laxative by stimulating the muscular coat of the intestines, as well as by increasing the intestinal secretions. It first lowers, then raises the arterial tension; increases the heart-beat in frequency, but depresses the power of the cardiac muscle,

though not destroying it. It produces dyspnoea by a tetanic action on the respiratory muscles, causing CO₂ poisoning, and death by paralysis of respiration. It contracts the pupils (how, is disputed) and the ciliary muscle, producing marked myosis. It is eliminated chiefly by the kidneys, the urine of the animal affected poisoning another.

Physiological Antagonists. *Atropine* as to the respiration, heart and pupil. *Chloral* is also antagonistic, but to be effective must be administered some time before the ingestion of the *Physostigma*.

Therapeutics. *Physostigma* has but a small field of action. In—*Constipation*, due to torpor of the bowels,—combined with *Belladonna* and *Nux Vomica*, it is sometimes very effective.

Tetanus,—it has been used with great advantage to diminish reflex excitability; grain doses of the extract repeated every two hours.

Progressive Paralysis of the insane—this drug seems to retard it.

Strychnine and Atropine Poisoning,—*Physostigma* is antagonistic.

Eye Diseases,—*Eserine* is now used by ophthalmologists for almost every indication, just as a few years ago they used its exact antagonist—*Atropine*; a remarkable instance of the influence of fashion, as well as of the value of contraries. It is useful to break up or prevent adhesions of the iris, to relieve tension, to prevent suppuration after operations, as well as to contract the pupil and the vessels of the eye, thereby relieving pain and photophobia.

ACONITUM,—Aconite.

Source and Composition. The tuberous root of *Aconitum Napellus*, a perennial plant found in mountainous regions. Its active principle is the alkaloid *Aconitine*, which it contains in the proportion of .03 per cent. It also contains several other principles concerning which the authorities are much divided, viz. — *Napelline*, *Aconine*, *Pseudaconitine*, *Lyctonine*, together with *Aconitic Acid*.

Preparations.

Abstractum Aconiti, Abstract of Aconite, gr. $\frac{1}{8}$ –j.

Extractum Aconiti fluidum, ℥ $\frac{1}{4}$ –℥ij. *Extractum Aconiti*, gr. $\frac{1}{8}$ – $\frac{1}{2}$.

Tinctura Aconiti, ℥ss–iv;—is of 40 per cent. aconite strength, and being a tincture of the root is many times more powerful than the former tincture of the leaves, which is still to be found in the shops. Fleming's Tincture has 79 per cent., the Br. 16, the French 20, the German 10; so that great care must be used not to mistake one for another.

**Aconitina*, gr. $\frac{1}{200}$ — $\frac{1}{50}$, difficult to obtain of constant strength, some samples being all but inert, others extremely active. The "Aconitine Cristallisée" of Duquesnel (a Nitrate of Aconitine, *Squibb*), is considered the most active of the samples in the market.

**Aconitinæ Oleatum*, Oleate of Aconitine :—2 per cent. for external use.

**St. Jacob's Oil* is a weak Aconite Liniment which also contains Ether, Alcohol, Turpentine, red coloring matter, and Water (*Squibb*).

Physiological Actions. Aconite is a powerful cardiac, respiratory, and spinal depressant, also diaphoretic, diuretic and antipyretic. It paralyzes both sensory and motor nerves,—the sensory being affected first and from the periphery inwards, while the motor nerves are affected from the centres outwards. It relaxes the inhibitory apparatus of the heart, and paralyzes the cardiac muscle and its contained ganglia, the respiratory centres and the spinal cord in all its functions, sensory, reflex and motor, but does not affect the cerebrum. The taste of Aconite is bitter, acrid and pungent. Soon after the ingestion of even a small quantity, a sensation of numbness and a persistent tingling are felt in the tongue and lips. Full medicinal doses cause a sense of constriction in the fauces, irritation of the gastro-intestinal mucous membrane, with increased secretion; sometimes nausea and vomiting, and severe pains in the joints and muscles; always more or less salivation, diaphoresis and diuresis, reduced respiratory power, cardiac rate and force, lowered arterial tension and temperature.

A Lethal Dose produces great muscular weakness, dimness of sight, dilated (sometimes contracted) pupils, shallow, irregular and labored respiration, a slow and weak pulse, coldness of the surface, clammy sweat, great anxiety, numbness and tingling in the extremities; lowering of the body temperature (2° to 3°), abolishment of sensation, reflexes and motility; and finally death from paralysis of the heart and respiration, with or without convulsions, consciousness being preserved until near the end, when CO_2 narcosis sets in.

Aconite is rapidly diffused and slowly excreted; the effects of a full medicinal dose continuing for three or four hours. Applied externally it paralyzes the sensory nerves of the part, producing its characteristic numbness and tingling.

Physiological Antagonists. *Atropine*, *Morphine* and *Ammonia* antagonize its effects on the heart and respiration. *Digitalis* counteracts its heart action and the relaxation of cardiac inhibition. (See *ante*, page 67.) In Aconite poisoning, the stomach should be evacuated, warmth

applied to the extremities, stimulants administered, artificial respiration if necessary, and the recumbent posture strictly maintained.

Therapeutics. Aconite antagonizes the fever process, and rightly used is, therefore, one of the most valuable drugs we possess. It has been called the "therapeutic lancet," and certainly is responsible to a great extent for the disuse into which venesection has fallen. Its power over the circulation, respiration and transpiration render it of the greatest value in all affections characterized by high resisting pulse, dry, hot skin, and elevated body temperature. It is especially useful in—

Acute Throat Affections, as tonsillitis, pharyngitis, etc.—drop-doses of the tincture every hour are remarkably efficient in these affections.

Acute Inflammations of the Respiratory Organs, as bronchitis, coryza, pneumonia, etc.,—Aconite is efficient in the early stage, when there is present a sthenic febrile action, with high temperature.

Acute Pleuritis and Peritonitis, previous to the stage of effusion,—Aconite combined with Opium is considered to be the best treatment.

Simple and Eruptive Fevers, particularly scarlet fever and measles,—are best treated by small repeated doses of Aconite, which in measles is particularly efficient from its power to arrest the catarrhal pneumonia.

Puerperal Fever,—Aconite steadily used, with an occasional dose of Castor Oil, is one of the best agents in the metritis form.

Surgical Fever, is promptly met by Aconite, which is especially useful in preventing chill after the passage of the urethral sound or catheter.

Erysipelas Faciei,—Aconite is highly serviceable, and usually curative.

Acute Rheumatism has been extensively treated with Aconite, and always with the best results. It lessens the duration of the fever, mitigates the pain and swelling of the joints, and prevents the occurrence of organic heart disease, if used from the commencement.

Cardiac Affections characterized by over action or hypertrophy, without valvular lesion, are benefited by Aconite.

Diarrhœa and Dysentery, from cold or exposure,—Aconite is unquestionably beneficial. It also relieves *Constipation* in patients of plethoric habit, with dry, hot skin, and a feverish tendency.

Menstrual Suppression from a chill,—Aconite relieves promptly.

Neuralgia, especially of the face or brow,—Aconite is very efficient, having a selective influence on the 5th nerve. It may be used internally and also applied locally over the seat of pain; for the latter purpose a

reliable *Aconitine* should be used, mixed with Chloroform and Oleic Acid, the Chloroform aiding the inward osmosis of the drug.

VERATRUM,—Hellebore.

Forms of Veratrum. *Veratrum viride*, American Hellebore; *Veratrum album*, European Hellebore; and *Veratrum sabadilla*, or *Asagraea officinalis*, the Mexican variety. Of these the first alone is official in the U. S. Phar., though an alkaloid or mixture of alkaloids from the *Veratrum sabadilla* is recognized under the name *Veratrine*. The alkaloids found in each plant are—

In *V. viride*,—*Jervine*, *Pseudo-jervine*, *Cevadine*, *Rubijervine*.

In *V. album*,—*Jervine*, *Veratralbine*, *Pseudo-jervine*, *Rubijervine*.

In *V. sabadilla*,—*Veratrine*, *Cevadine*, *Cevadilline*.

Veratroidine is now considered a mixture of *Rubijervine* and Resin.

Preparations.

Tinctura Veratri Viridis, $\text{M}_{\text{ij-x}}$;—a 50 per cent. tincture of the root.

Extractum Veratri Viridis Fluidum, $\text{M}_{\text{j-v}}$;—also from the root.

Veratrina, *Veratrine*, gr. $\frac{1}{50}$ — $\frac{1}{30}$. Prepared from the seeds of *V. sabadilla*.

Oleatum Veratrinæ, 2 per cent. *Unguentum Veratrinæ*, for local use.

Physiological Actions. The action of *Veratrum Viride* is closely allied to that of *Aconite*, being a powerful cardiac depressant and spinal paralyzant. It differs from *Aconite* in affecting the respiration to a much less degree,—in being a systemic emeto-cathartic—in paralyzing the motor system centrally, impairing the reflexes, but leaving sensation unimpaired,—and in having little or no diaphoretic or diuretic action. It causes great depression, but is seldom fatal; when death does result from its use it occurs by paralysis of the heart.

Veratrum Album contains a very powerful alkaloid, *Veratralbine*, and also an irritant poisonous resin (?). Its general action is similar to that of its congener, but it is much more irritant to the gastro-intestinal mucous membrane, causing violent vomiting and purging, intense abdominal and cesophageal pain, greatly reduced temperature and pulse, collapse, and death from cardiac and respiratory paralysis.

Veratrine is an acrid, intensely irritant powder, probably consisting of a mixture of alkaloids. It causes violent sneezing, a burning sensation, and free salivation. It affects the heart and circulation similarly to the other *Veratri*, and in addition seems to be a direct poison to muscular tissue, and to cause violent convulsions before the muscular paralysis sets

in. The alkaloids *Jervine* and *Rubijervine* both depress the circulation, while the latter produces the emeto-catharsis.

Treatment in Veratrum Poisoning,—is similar to that for Aconite. *Morphine* and *Atropine* antagonize the cardiac depression.

Therapeutics. Veratrum is inferior to Aconite in fevers and inflammations, by reason of its lack of power over excretion, but is used in—*Aneurism*,—to depress the circulation to the lowest point; the recumbent posture must be strictly observed, to secure safety to the heart.

Cardiac Disorders, such as simple hypertrophy, irritable heart,—Veratrum Viride is often used with great benefit.

Acute Mania and Puerperal Convulsions, it has frequently been employed with remarkably good results, but has often failed.

Parenchymatous and Serous Inflammations, in their early stages,—Veratrum Viride renders good service, especially in *Pneumonia*.

Superficial Neuralgiæ,—the Oleate or Unguentum Veratrinæ externally.

Myalgia and Headaches may often be relieved by the same application.

Puerperal Fever,—when due to metritis Veratrum Viride is highly extolled by Fordyce Barker and other authorities of standing.

ARNICA AND TRIMETHYLAMINE.

Source and Composition. The flower heads and rhizome of *Arnica montana*, or Leopard's bane, a plant growing in mountainous districts throughout the northern hemisphere. Its constituents are *Trimethylamine* (C_3H_9N), an ammoniacal, alkaline, liquid alkaloid; also an inert principle named *Arnicin*, Capronic and Caprylic Acids, Inulin, Tannin, Mucilage and Resins.

Other Sources of Trimethylamine. It is contained in *Oleum Morrhue*, *Humulus* and *Ergot*, and is also obtained by chemical processes from fish-brine, human urine, codeine, and the residue left in making beet-sugar.

Preparations. Both leaves and root are official.

Tinctura Arnicæ Florum, ℥v–ʒss. Strength 20 per cent.

Tinctura Arnicæ Radicis, ℥v–xv. Strength 10 per cent.

Extractum Arnicæ Radicis, gr. j–v. *Extr. Arnicæ Rad. Fluid.*, ℥v–xv.

Emplastrum Arnicæ. Contains $33\frac{1}{3}$ per cent. of the Extract.

**Trimethylamina*, ℥j–ij. The Chloride of Trimethylamine is a very powerful antipyretic in doses of gr. ij every three hours.

Physiological Actions of Arnica. It is irritant, stimulant, depressant, antipyretic, diuretic, and a vulnerary. It irritates the gastro-intestinal tract, and in alcoholic solution excites erysipelatous inflammation of the skin in some persons. *In Small Doses* Arnica increases the action of the heart, raises the arterial tension, and stimulates the action of the skin and kidneys. *Large Doses* produce a transient excitement, followed by depressed circulation, respiration and temperature; violent headache, dilated pupils, and muscular paresis. *A Toxic Dose* paralyzes the nervous system of animal and organic life, causing collapse and death.

Trimethylamine—is an active escharotic, and a gastro-intestinal irritant; lowers the rate and force of the heart, decreases the body temperature, and diminishes (sometimes increases) the excretion of urea.

Therapeutics. In—

Typhus and Typhoid Fevers,—5-minim doses of the Tincture as a stimulant; larger doses as an antipyretic when patient is of sthenic reaction.

Delirium Tremens with depression,—the Tincture is serviceable.

Rheumatism and Rheumatic Gout,—Arnica or Trimethylamine in the acute forms, to moderate the fever, subdue the joint inflammation, and lessen the danger of cardiac implication.

Sprains, Bruises, etc.,—the dilute Tincture locally has a popular reputation. *Ecchymoses* are rapidly dispersed by its use locally and internally. An infusion is better for local use, as the tincture may excite dermatitis.

Internal Bruises from shocks or concussions,—its internal use has proven very efficacious in many instances (Phillips).

Cuts, Wounds, etc.,—the aqueous preparations locally used promote the rapid union of cut surfaces.

Hemorrhages, Epistaxis, Hemoptysis, etc.,—it is undoubtedly effective.

Concussion of the Brain,—Arnica is highly recommended (Phillips).

Chronic Dysentery, with slimy and bloody stools, tormina and cutting pains,—the Tincture internally is often a very efficient remedy.

Paralysis of the Bladder has been cured by Arnica, used internally.

Chorea,—Trimethylamine has been successfully used.

Chronic Rheumatism,—Trimethylamine as a liniment, 1 part to 3 of glycerine, gives relief to the pains, equal to that produced by any anodyne.

TABACUM,—Tobacco.

Source and Composition. The commercial dried leaves of *Nicotiana Tabacum*, a native of tropical America. It contains a powerful liquid alkaloid *Nicotine*,—together with Malic Acid, alkaline salts, and a peculiar camphor named *Nicotianin*. Its combustion gives rise to several empyreumatic products, of which *Pyridin* is the most powerful. Tobacco-smoke contains little or no Nicotine.

Liquid Alkaloids besides Nicotine,—Lupuline, Conine, Lobeline, Muscarine, Sparteine.

Preparations. Tabacum (as above) is the only official preparation.

**Infusum Tabaci*, (\mathfrak{z} j to the pint), \mathfrak{Z} ss–iij, as enema. Dangerous.

**Vinum Tabaci*, (\mathfrak{Z} j to the pint), $\mathfrak{m}\nu$ – \mathfrak{z} j. Must be used cautiously.

**Oleum Tabaci*, an empyreumatic product, obtained by distillation.

**Nicotina*, Nicotine, $\mathfrak{m} \frac{1}{20}$ – $\frac{1}{10}$ in strychnine poisoning, up to $\mathfrak{m}\mathfrak{j}$.

Physiological Actions. Tobacco is a very depressant nauseant, an emetic by systemic and irritant action, a sternutatory, diuretic, diaphoretic, cathartic, sedative, antispasmodic, and narcotic. It paralyzes the motor nervous system; the action commencing at the periphery and extending to the spinal cord. It produces increased salivary and intestinal secretions, diuresis, tremor, clonic spasms, and a tetanic stage previous to its paresis. It contracts the pupils, depresses the heart, lowers the arterial tension, and reduces the body temperature, causes profuse sweating, cold and clammy skin, collapse and death usually by paralysis of respiration, sometimes by paralysis of the heart. It does not impair the muscular irritability, nor does it act on the cerebrum directly.

The empyreumatic products of Tobacco are similar in action but less powerful. Fatal results have followed the inhalation of the vapor.

The continued use of Tobacco by smoking or chewing to excess produces granular inflammation of the fauces and pharynx, atrophy of the retina, dyspepsia, lowered sexual power, nervous depression, and occasionally angina pectoris. Used by the young it hinders the development of the higher nervous centres, and impairs the nutrition of the body by interfering with the processes of digestion and assimilation.

Nicotine is almost as rapidly fatal as Prussic Acid, death having occurred from a toxic dose in three minutes, with no symptoms except a wild stare and a deep sigh.

Antagonists and Antidotes. *Strychnine* is the true physiological antagonist of Nicotine (or Tobacco) and vice versa. Alcohol, Ammonia, Ergot, Digitalis, Belladonna, etc., antagonize its action on the circulation. Evacuation of the stomach, Tannin, Iodides, and artificial respiration, are the means resorted to in Tobacco poisoning.

Therapeutics. Tobacco is now but little used in medicine. The chief indications for it are (1) to relax spasm, (2) locally, to relieve pain. But the danger attending its employment, either internally or externally, has caused its supersedence by other agents of less violent action. It may be employed in—

Habitual Constipation,—the wine is a good remedy, \mathfrak{m}_{v} at bedtime. Smokers rarely suffer from constipation, but frequently experience an immediate laxative result after their morning cigar.

Intestinal Affections, as impaction of the cæcum, intussusception, and strangulated hernia,—not over \mathfrak{z}_{iv} of the Infusion as enema has often been very effective in relaxing spasm, but is a dangerous expedient.

Spasmodic Asthma and Emphysema,—for the dyspnœa.

Tetanus,—no remedy more effective than minim-doses of the alkaloid every two hours by the stomach, or \mathfrak{m}_{ij} by the rectum; or \mathfrak{z}_{iv} of the Infusion as an enema, repeated for effect; or still better, the Wine, in ten-minim doses, repeated for effect. [See formula below.]

Dropsy, especially in the renal form,—Tobacco is an efficient diuretic.

Nymphomania, Chordee, etc., are easily conquered by Tobacco.

Strychnine Poisoning,—Tobacco is an effective antagonist. Gr. ss of Nicotine in \mathfrak{z}_{ij} Aquæ destil. hypodermically; of this \mathfrak{m}_{x} contain gr. $\frac{1}{24}$. The Infusion has also been used successfully, but the alkaloid permits of more precise administration.

Fatigue,—Tobacco, moderately used, aids to support the system, when under excessive exertion, food and rest being deficient.

LOBELIA,—Indian Tobacco.

Source and Composition. The leaves and tops of *Lobelia inflata*, a North American weed. It contains a liquid alkaloid, *Lobeline*,—also *Lobelic Acid*, *Lobelacrin*, resin, wax, etc.

Preparations.

Tinctura Lobeliæ, \mathfrak{m}_{v} —xxx.

Extractum Lobeliæ Fluidum, \mathfrak{m}_{j} —x.

Acetum Lobeliæ, \mathfrak{m}_{v} —xx.

**Lobelin* (a resinoid), gr. ss—gr. j.

Physiological Actions. Lobelia has an acrid, nauseous taste, and a very unpleasant odor. It is expectorant, diaphoretic, purgative, emetic, anti-spasmodic and narcotic. It excites an abundant flow of saliva, much gastric mucus, and profuse urination and sweating; with nausea, vomiting, and great depression. The action of the heart is enfeebled, the blood pressure, at first increased, soon falls; muscular debility reduced temperature ensue, then coma and death by paralysis of the respiratory centre. The motor nervous system is chiefly affected, especially the medulla oblongata, and the nucleus of the pneumogastric contained therein.

Physiological Antagonists. Strychnine, Picrotoxin, Thebaine, antagonize its action on the nervous system; the vaso-motor excitants, as Alcohol, Digitalis, Belladonna, oppose its effects on the circulation.

Therapeutics. Lobelia has gone out of fashion, yet is useful in—
Asthma,—a teaspoonful of the Tincture every 15 minutes until nausea ensues, gives decided relief in the paroxysm.
Cough of dry, harsh character, with tickling in the throat and spasmodic dyspnoea,—Lobelia is an extremely effective expectorant.
Constipation, from atony and deficient secretion,—a ten-minim dose of the Tincture or Acetum at bedtime is excellent.
Impaction of the Cæcum, before inflammation occurs,—two-drop doses of the Tincture every hour will often relieve the obstruction.
Strangulated Hernia,—the Infusion as an enema is much safer than Tobacco, and fully as efficient; but other laxatives are better.
Intussusception,—the Infusion as an enema may overcome the obstruction, but it is rarely used.
Poison-oak Eczema,—an Infusion (\mathfrak{z} j to the pint) locally, is efficient.
As an Emetic Lobelia is entirely too depressant to be given to children.

THE NITRITES.

Amyl Nitris, Nitrite of Amyl, ($C_5H_{11}NO_2$),—is a clear, yellowish, oily liquid, of a powerful and ethereal odor, extremely volatile, insoluble in water, but soluble in alcohol, ether, chloroform and benzin. It is produced by the action of Nitric or Nitrous Acid upon Amylic Alcohol, and may be administered by inhalation or internally, in doses of \mathfrak{m} ij–v, but larger doses are probably safe.

***Nitro-Glycerinum** or **Glonoinum**,—Nitro-Glycerin, $C_3H_5(NO_3)_3$, clear, oily liquid, insoluble in water, but soluble in alcohol. It is produced by the action of Nitric and Sulphuric Acids upon Glycerin, and may be administered in doses of $\mathfrak{m}_{\overline{100}}$. It is highly dangerous as an

explosive, and should not be kept in stronger solution than a 1 per cent. solution in alcohol.

**Tinctura Nitro-glycerini*,—strength 1 per cent. Dose, m_{ss} – m_x . The strong tincture official in the American Homœopathic Pharmacopœia, (2d ed. Boericke & Tafel, Philadelphia, 1883, page 235,) and presumably sold by them on demand, is a ten per cent. solution, or ten times stronger than the above. It is an extremely dangerous preparation, both as an explosive and as a medicine.

**Sodii Nitris*, Nitrite of Sodium, gr. ss–gr. ij or v, according to individual susceptibility. **Potassii Nitris*, Nitrite of Potassium,—Dose, gr. ss–v.

Physiological Actions. The Nitrites agree in their general action, producing great vascular dilatation by paralyzing either the sympathetic system, the vaso-motor centre, or the muscular coat of the arterioles; tumultuous action of the heart, by relaxation of its inhibitory apparatus; diminished sensation, motion and reflexes; a sensation of heat, but lowered body temperature; lowered respiration, from paralysis of the respiratory muscles and impairment of the ozonizing function of the blood; throbbing pain in the head, beating carotids, flushed face and vertigo.

Amyl Nitrite is the most prompt, but less enduring in action, and is best given by inhalation. *Nitrite of Sodium* acts similarly, but less promptly. *Nitro-glycerin* is less prompt and less violent, and more suitable for internal administration. Its headache is of intense frontal character, and persists for hours after the other effects have passed off. Its action is more enduring than that of *Amyl Nitrite*.

Therapeutics. The Nitrites are well used in—

Angina Pectoris, especially when characterized by a great rise of arterial tension,—*Amyl Nitrite* inhaled, to lessen the arterial spasm and palliate the agony of the attack, is usually very efficient.

Epilepsy,—when the aura is felt, the inhalation of a drop or two of *Amyl Nitrite* will generally abort the paroxysm. Its repetition requires increased dosage to produce the desired effect.

Respiratory Neuroses, as spasmodic asthma, whooping-cough, laryngismus stridulus, etc., are relieved in many cases by these agents.

Tetanus is palliated by *Amyl Nitrite*, especially during the fixation of the muscles of respiration.

Neuralgic Dysmenorrhœa has often been benefited by *Nitro-glycerin*.

Vomiting and *Nausea*, also *Sea-sickness*, are benefited by the Nitrites.

Cold Stage of intermittents and pernicious remittents may be aborted by the inhalation of *Nitrite of Amyl*, preventing internal congestions.

Chronic Interstitial Nephritis,—Nitro-glycerin has proved of great value, by redistributing the blood supply to the kidneys, cut off by degeneration of the renal ganglionic centres.

Migraine, of the pale-face form,—Amyl Nitrite is indicated.

Convulsions, of various kinds, including puerperal,—the Nitrites are useful.

ACIDUM HYDROCYANICUM,—Prussic Acid.

Preparations.

Acidum Hydrocyanicum Dilutum, ℥j–ijj. Is a solution of 2 per cent. of the anhydrous acid in 98 per cent. of alcohol and water. ℥xl of this preparation have proved fatal.

Potassii Cyanidum, gr. $\frac{1}{20}$ – $\frac{1}{10}$. Locally, a solution of gr. j–v to the \mathfrak{z} .

**Scheele's Dilute Hydrocyanic Acid* is a 4 or 5 per cent. solution, and is highly dangerous, even by inhalation.

Oleum Amygdalæ Amaræ, Oil of Bitter Almond,—contains a varying quantity of Hydrocyanic Acid, due to the reaction between the principle Amygdalin and the ferment Emulsin. Dose, ℥ $\frac{1}{4}$ –j, in mixture.

Physiological Actions. Hydrocyanic Acid and Nicotine are the most powerful poisons known, gr. ss of the former having caused death. Its inhalation produces rapid insensibility and almost immediate exhaustion, death probably occurring from sudden paralysis of the heart and respiration. Some volitional movements may be made before death, unless the dose be very large. Its paralyzant action is expended on the centres, the peripheral nerve organs, and even the muscular tissue, the muscles being fixed in tetanic rigidity after death. The blood is found, on post-mortem examination, to be dark and fluid, and the venous trunks and cerebral sinuses gorged therewith. The odor of Prussic Acid is fragrant, resembling that of bitter almonds or peaches. The effects of a medicinal dose pass off in an hour, at most.

Cyanide of Potassium has similar action, and, in addition, possesses some peculiar to itself. Locally, it causes inflammation of the skin, with an eczematous eruption, and if applied in quantity to an abraded surface will produce fatal effects.

Physiological Antagonists. *Atropine* has antagonistic action, but is too slowly diffused to be of any value. *Ammonia* by inhalation, by the stomach, and by intravenous injection, with cold affusion to the spine and artificial respiration,—are the measures most likely to avail in cases of poisoning, where there is time to do anything.

Antidote to Cyanide of Potassium,—is *Sulphate of Iron*, producing

Prussian Blue (Ferrocyanide of Iron). Then evacuation of the stomach, artificial respiration, and *Ammonia* by intravenous injection.

Therapeutics. Hydrocyanic Acid is a very useful and pleasant remedy. It is well employed in—

Coughs of spasmodic character, whooping-cough, hiccough, laryngismus stridulus, and other neuroses of the respiratory organs, or affections involving the pneumogastric nerve.

Gastralgia,—it is one of the most efficient remedies, also in *Headache* and *Vertigo* due to stomachal derangement; and in *Nervous Vomiting* of various kinds,—it is efficient.

Acute Mania and Melancholia,—it has been successfully employed.

Round Worms (Lumbricoides), are promptly killed by doses of 2 or 3 minims every 2 hours for 24 hours, followed by calomel. Both agents, being tasteless, are useful for children.

Skin Diseases, Pruritus, etc.—Hydrocyanic Acid is a very grateful application to allay itching. Or the Cyanide of Potassium in ointment, gr. v or vj to the ℥, carefully avoiding abraded surfaces.

Headache, of reflex type,—Cyanide of Potassium in solution, gr. iij–v to the ℥, applied locally on a compress, gives great relief.

Stains from Nitrate of Silver are removed by a similar solution.

*BARIUM,—Barium.

Preparations. But one is used, viz.—

**Barii Chloridum*, gr. ss–v, is freely soluble in water or alcohol.

Physiological Actions. Barium has a strongly metallic taste, excites secretion and salivation, and is a gastro-intestinal irritant, causing nausea, vomiting and purging. *In Small Doses* it stimulates the organic nerves, producing prompt peristalsis of the intestines, and contraction of the muscular layer of the arterioles. *On the Heart* its action is at first slightly depressant, soon followed by a rapid rise. The arterial tension is greatly raised by constriction of the arterioles almost to obliteration of their capacity, and the heart is at the same time slowed. *A Toxic Dose* dilates the pupils, causes muscular tremor and rigidity, convulsions and insensibility. It paralyzes the nervous system, death occurring by paralysis of respiration.

Treatment of Barium Poisoning. The sulphate being very insoluble, it should be produced and then evacuated. *Amyl Nitrite*, *Nitroglycerin* and similarly acting agents are its physiological antagonists.

Therapeutics. Barium was originally employed as an “alterative,” but had fallen into disuse. It is a useful drug in—

Aneurism and Hemorrhage, in which its contractile power over the vessels may be advantageously employed.

Congestions of various kinds,—should be a good field for it;—and it is indicated in *Paralysis of the Bladder*, and in *Constipation* due to lack of secretion or to torpor of the intestinal muscular fibres.

PULSATILLA,—Pasque-flower.

Source and Composition. Pulsatilla is the herb, collected soon after flowering, of *Anemone Pulsatilla*, *Anemone pratensis*, and *Anemone patens*, var. *Nuttalliana*, small plants of the same natural order as Aconite, (*Ranunculacææ*);—the first two being indigenous to Europe and Siberia, the third being a native of the United States. All are inodorous, very acrid, and contain *Anemonin*, a volatile camphoraceous principle, and *Anemoniac Acid*.

Preparations. The herb is alone official, but a tincture may be made according to the pharmacopœial directions for Tinctures of Fresh Herbs, consisting of equal parts of the juice and alcohol, which may be used in doses of $\mathfrak{m} \frac{1}{10}$ —x.

**Anemoninum*, Anemonin,—Dose, gr. $\frac{1}{10}$ —ij, in pill.

Physiological Actions. Pulsatilla is a paralyzer of motion and sensation, a gastro-intestinal and cutaneous irritant, a cardiac and respiratory depressant. It dilates the pupil, and produces diaphoresis and diuresis. Locally applied it produces numbness and tingling in the part, and may even excite violent inflammation.

Therapeutics. Pulsatilla is a very efficient drug if a fresh preparation be employed. It is excellent in—

Uterine Affections, as functional amenorrhœa, dysmenorrhœa, suppression of the menses from fright or chill and leucorrhœal discharges.

Epididymitis is often controlled and dissipated by a very small dose of Pulsatilla,—a few drops of the tincture in a glass of water, and of this a teaspoonful every two hours (Piffard).

Dyspepsia, or sub-acute gastritis, with white-coated tongue, no taste or a greasy sensation in the palate, nausea, flatulence, heartburn, etc.,—Pulsatilla in 5-drop doses of the tincture every four hours.

Coryza, *Otitis*, *Rhinitis*, *Conjunctivitis*, and other inflammations of mucous membranes with mucous or muco-purulent discharge,—Pulsatilla internally and locally (\mathfrak{z} j—ij of the tincture to \mathfrak{z} iv aquæ as lotion).

Coughs of irritative character, whooping cough, etc.,—Anemonin in doses of gr. ss—j has been found very useful.

Tape-worm,—an extract of the root has proved an efficient tœniacuge.

Cutaneous Affections, especially the eczematous forms, ulcers of indolent character, and syphilitic eruptions,—*Pulsatilla* locally and internally.
Acute Meningitis, cerebral and spinal,—it is said to have been efficiently used.

GRINDELIA,—*Grindelia*.

Source and Composition. The leaves and tops of *Grindelia robusta*, an herbaceous Californian plant. Its composition has not yet been definitely ascertained; but it probably contains an alkaloid, a resin, and a volatile oil.

Preparations. Only one is official,—

Extractum Grindeliæ Fluidum, ℥v-℥j. Is extremely nauseous.

**Tinctura Grindeliæ*, ℥x-℥ij. **Extractum Grindeliæ*, gr. ij-v, in pill.

Physiological Actions. *Grindelia* is not actively toxic, large doses being required to kill small animals. Taken in quantity it excites nausea and vomiting, depresses the heart, respiration and temperature, dilates the pupils, and causes sleep with lowered cutaneous sensibility and reduced reflexes. Finally it produces motor paralysis, beginning in the legs, and causes death by paralysis of the muscles of respiration. It is slowly eliminated by the kidneys and the lungs, imparting to the urine and breath a peculiar violaceous odor. It is markedly diuretic.

Therapeutics. *Grindelia* is especially indicated in spasmodic affections of the respiratory organs. In—

Spasmodic Asthma,—it has no equal as a palliative; 3-grain doses of the extract to avert the attack, or ℥xx-xxx of the fluid extract every half hour, beginning at the very onset. The dried leaves may be smoked in cigarettes, or the plant may be steeped in a saturated solution of potassium nitrate, dried and ignited, the patient inhaling the fumes.

Hay Fever,—is amenable to *Grindelia* in many instances; the fluid extract 4 parts, with 1 part each of the fluid extracts of *Rhubarb* and *Senna*, of which ℥ij every half hour during the paroxysm, and afterwards at intervals of three hours.

Whooping-Cough, Coughs of Imitation and Habit, and in those of spasmodic character,—are helped by *Grindelia*.

Spasmodic Dyspnoea, accompanying various pulmonary and cardiac diseases,—*Grindelia* is often a very efficient remedy.

Chronic Pyelitis and Cystitis, and other catarrhs of the genito-urinary passage,—*Grindelia* is very serviceable, being deposited as an oleo-resin all along the urinary tract.

Rhus Poisoning,—the fluid extract of *Grindelia* is said to be one of the most efficient local applications in poisoning by *Rhus toxicodendron*, and is also used internally as an antidote thereto.

***QUEBRACHO,—Quebracho.**

Source and Composition. The bark of *Aspidosperma Quebracho* (Q. Blanco), an evergreen tree growing in Chili and the Argentine Republic. It is supposed to contain two alkaloids, named *Aspidospermine* and *Quebrachine*.

Preparations. **Vinum Quebracho*, ℥j-℥j.

**Tinctura Quebracho*, ℥j-iv. **Extractum Quebracho Fluidum*, ℥v-℥j.

Physiological Actions. Quebracho has a bitter taste, and in large doses causes severe salivation, nausea, vomiting, vertigo and headache. In animals it paralyzes the motor nervous system and lowers the reflexes, producing great dyspnoea, and death apparently from asphyxia. It lessens the rate of respiration, and seems to decrease the sensation of need for air after active exercise.

Therapeutics. Quebracho is extensively advertised for—

Dyspnoea, from any cause, in which it is said to be palliative, but as often fails. It may relieve the dyspnoea of asthma, emphysema, bronchitis, etc., but is useless in that due to organic disease of the heart, or in aged subjects of atheroma.

PHYTOLACCA,—Poke.

Source and Composition. The berry and root of *Phytolacca decandra*, a N. American plant. It contains a neutral principle, *Phytolaccin*; also *Phytolaccic Acid*, tannin, starch, a fixed oil, etc.

Preparations. Though both the berry and root are official, no preparations are mentioned in the U. S. Pharmacopœia.

Phytolaccæ Bacca, Poke-berry. *Phytolaccæ Radix*, Poke-root, gr. j-℥ ss.

**Tinctura Phytolaccæ*, ℥x-℥j. **Extr. Phytolaccæ Fluidum*, ℥v-℥ ss.

Physiological Actions. *Phytolacca* depresses the heart-rate and the respiration, and is a paralyzer of motion by central action on the spinal cord. It is a slow and depressant emeto-cathartic, irritates the throat and tonsils; produces tetanic convulsions in animals, and death by paralysis of respiration. Several cases of poisoning by this plant have occurred.

Therapeutics. *Phytolacca* is useful in—

Mastitis, to arrest the inflammation and prevent suppuration,—the extract may be applied locally and the fluid extract given internally.

Varicose Ulcers, and other ulcers of the leg,—it promotes healing.

Eczema of obstinate character,—has been cured by *Phytolacca* extract applied locally; also *Tinea Capitis*, and other skin affections.

Chronic Rheumatism of fibrous tissues,—used internally, it acts efficiently.

Tonsillitis, Diphtheritic Sore Throat and Chronic Follicular Pharyngitis,—are affections in which Phytolacca has been much employed with good results, especially when high fever and pains in head, back and limbs. In true adynamic Diphtheria it will do little good.

***AILANTHUS**,—Tree of Heaven.

Source and Composition. The bark of *Ailanthus glandulosa*, a well-known shade-tree. Its properties probably depend on the Oleo-resin and Volatile Oil which it contains.

Preparations.

**Tinctura Ailanthūs*, ℥x-℥ij. *Extr. Ailanthūs Fluidum*, ℥x-℥j.

Physiological Actions. *Ailanthus* paralyzes the cerebrum and spinal cord of animals, the loss of motility beginning in their hind extremities. It is a drastic purgative and a decided nauseant, causing also weakness, vertigo, cold sweats, dull headache, pains in the back, numbness and tingling in the limbs. The heart's action is at first increased but soon becomes slowed, the respiration being also depressed. *Ailanthus* is a good tænia-fuge. It kills by paralysis of respiration.

Therapeutics. It has well been employed in—
Malignant Scarlatina, with dark and partial eruption, insensibility, delirium, and other symptoms of cerebral implication.
Tape-worm,—a decoction of the fresh bark (℥j ad ℥iv) is very efficient, or the oleo-resin in drachm-doses.

BRYONIA,—Bryony.

Source and Composition. The root of *Bryonia alba* and of *Bryonia dioica*, European perennial herbs. Its active principle is the bitter glucoside *Bryonin*. Dose of the root, gr. x-xxx.

Preparations. Only one is official, viz.—

Tinctura Bryoniæ,—*Bryonia*-root 1, Alcohol 9. Dose, ℥ss-℥ss.

**Bryonin*, as a drastic purgative, gr. $\frac{1}{8}$ - $\frac{1}{8}$. Poisonous in dose of gr. iij-iv.

Physiological Actions. *Bryonia* is violently irritant to the mucous and serous membranes; taken internally it has caused fatal gastritis; introduced into the pleura it has produced fatal pleurisy with fibrinous effusion. It is a drastic purgative, a powerful diuretic, and very depressant to the heart. It produces cerebral, hepatic and renal congestion, with bilious symptoms, even severe jaundice, and vesical tenesmus.

Therapeutics. Bryonia is especially indicated in the second stage of serous inflammations, to limit the extent of the effusion and to promote its absorption. For this, small repeated doses are required. In—

Pleuritis and Pericarditis,—it is useful after Aconite has reduced the pyrexia, to check the effusion and aid its absorption.

Rheumatism,—for the painful and stiff joints, after their swelling has been reduced by other measures.

Headaches, of “bilious” type, with vomiting,—it is an efficient remedy.

Dropsies,—an infusion of Bryonia will remove the accumulated fluid, by its cathartic and diuretic action.

Epilepsy, Mania and Hysteria,—Bryonia is of ancient repute.

SALICIN AND SALICYLIC ACID.

Salicin is a glucoside, consisting of *Saligenin* and glucose; found in Carbolic acid, Gaultheria procumbens (Wintergreen), and in the bark of several species of Salix (willow). **Salicylic Acid** is a derivative of Salicin, probably by double oxidation. It is largely produced, synthetically, by acting on carbolic acid with sodium and carbonic anhydrides. The natural acid is much more efficient therapeutically than the artificial one.

Salicinum, Salicin, gr. xx– $\overline{3}$ ij. Soluble in 28 parts of water at 59° F.

Acidum Salicylicum, Salicylic Acid, gr. v– $\overline{3}$ j. Soluble in 450 of water and in 2½ of alcohol, but 10 parts may be dissolved in 100 of water, by the aid of 8 parts of Borax.

Preparations containing these agents.

Sodii Salicylas, Salicylate of Sodium, gr. v– $\overline{3}$ j. } Very soluble in water.
Lithii Salicylas, Salicylate of Lithium, gr. v– $\overline{3}$ j. }

Physostigminæ Salicylas, Salicylate of Physostigmine, gr. $\frac{1}{100}$ – $\frac{1}{60}$.

Oleum Gaultheriæ, Oil of Wintergreen, ℥v–xv. (See page 128.)

Physiological Actions. *Salicin* is a bitter tonic, an antiferment, antiseptic, and destructive to low organisms. It prevents the reaction between amygdalin and emulsin, and that of ptyalin on starch. It seems to be devoid of toxic power on man, and is probably excreted as Salicylic and Salicyluric acids. It has some slight power as an antiperiodic.

Salicylic Acid has properties similar to the above. In small doses it stimulates the stomach, heart and respiration, but large doses derange the stomach, causing nausea and vomiting, depress the heart and respiration, lower the arterial tension, and reduce the temperature in fever. It causes vertigo, dilated pupils, tinnitus aurium, a sensation of tension in the frontal

cerebrum, delirium, and bed sores from depression of the circulation. It colors the urine *green* (due to Salicyluric Acid?).

Salicylate of Sodium is remarkably antipyretic in doses of gr. xv, given 4 or 5 times in 24 hours. It is a powerful diaphoretic.

Therapeutics. *Salicin* and its derivatives are chiefly used in *Acute Rheumatism*, to lower temperature, relieve pain, and reduce articular swelling. They are most suitable to strong, vigorous patients, and if not promptly efficient they should be abandoned. *Salicylic Acid* is much used as an antipyretic in fevers, especially those of the septicæmic kind. It is a useful local application to Corns and Warts, and in—

Eczema of hands and feet. Cancer. Fetid perspiration, in which it is
Gangrenous wounds. Burns. used in solution with Borax.

ACIDUM CARBOLICUM.—Phenylic Alcohol,—Phenol.

Carbolic Acid (C_6H_6O) is not an acid, but a crystalline alcoholic product of the distillation of coal-tar. **Creasote** is a similar oily product from wood-tar. ***Resorcin** ($C_6H_6O_2$) is also a phenol obtained from certain resins by the action of fusing alkalies, and is best prepared by fusing potassium-benzol-disulphonate with caustic potassa.

Differences in their Properties. By the action of *Nitric Acid* Carbolic is converted into Picric Acid, Creasote into Oxalic Acid chiefly. Carbolic Acid coagulates collodion, Creasote does not. All three are powerful antiferments and antiseptics; Resorcin is a valuable antipyretic. Carbolic Acid and Creasote are irritant to the skin and mucous membranes, Resorcin is not. Carbolic Acid is liquefied by 5 per cent. of water, more water rendering it turbid, until 20 parts of water to 1 of acid have been added, when a clear solution is formed.

Preparations.

Acidum Carbolicum, Phenol,—gr. $\frac{1}{4}$ —gr. j, well diluted.

Acidum Carbolicum Crudum,—used as a disinfectant. Contains Xylic and

Cresylic Acids, in varying proportions; also other impurities.

Unguentum Acidi Carbolici,—strength 10 per cent.

Creasotum, Creasote,—now very little used. Dose, m̄j—iij, well diluted.

Aqua Creasoti, Creasote Water,—strength 1 per cent. Dose, ʒj—ʒss.

Sodii Sulpho-carbolas, Sulpho-carbolate of Sodium, gr. x—xxx;—a combination of Sodium with Sulpho-carbolic Acid, which is a mixture of Sulphuric and Carbolic Acids.

* *Resorcinum*, Resorcin, gr. v—xv. As an antipyretic ʒj, not repeated for several hours;—or gr. v every 2 hours.

Physiological Actions. *Carbolic Acid* is a powerful antiseptic and antiferment, being very destructive to low forms of life. It is a local anæsthetic, and a superficial escharotic, coagulating albumen and the blood also when out of the body. Swallowed undiluted it produces violent gastritis. It stimulates the cardiac inhibition, first slowing the heart, then depressing and finally paralyzing it. Respiration, at first increased, is soon depressed, the pupils are contracted, and the brain and spinal cord are directly affected,—stupor, coma, suspended reflexes, impaired motility and sensibility being produced. It is rapidly absorbed and diffused, many fatal cases having occurred from its local employment in full strength. It is partly oxidized in the body, and partly eliminated by the lungs and kidneys, imparting to the urine a smoky appearance. $\text{m} \cdot \text{vj}$ of the pure acid have produced dangerous symptoms. *Creasote* has similar properties, but is not so toxic as Carbolic Acid.

Resorcin is not irritant to the skin or the submucous tissue, and but slightly so to mucous membranes. It is equally powerful as an antiseptic and antiferment, arresting decomposition and destroying low organisms. ʒss to ʒj causes a sense of heat, discomfort and oppression, followed by profuse perspiration and languor; if fever has existed the temperature is lowered several degrees, but rises again, after a rigor, in from two to four hours.

Antidotes and Antagonists to Carbolic Acid. *Sodium Sulphate* to form the sulpho-carbolate of sodium, and the official *Syrupus Calcis*, given freely, are the chemical antidotes. *Atropine* is said to be a very complete physiological antagonist, maintaining the heart and respiration until elimination occurs, which should be promoted by diluents, used freely.

Therapeutics. *Carbolic Acid* owes its past prominence to its having been the principal agent used in Lister's Antiseptic Method; but its use in that connection is now almost abandoned, most of the authorities believing that it does more harm than good. In $\frac{1}{4}$ -grain doses it is an excellent remedy for *Nausea and Vomiting*, and may be advantageously administered in dilute solution (2 to 5 per cent.) by spray, in many chronic pulmonary affections; also locally and by injection in—

<i>Catarrhs</i> ,—acute and chronic.	<i>Erysipelas.</i>	<i>Endo-metritis.</i>
<i>Parasitic Skin Diseases.</i>	<i>Synovitis.</i>	<i>Abscesses.</i>
<i>Uterine and other Ulcers.</i>	<i>Hydrocele.</i>	<i>Pulmonary Phthisis.</i>

Exanthematous Fevers, and other Septic diseases,—the Sulpho-carbolate of Sodium internally in 5-grain doses every two or three hours, has been much praised by many practitioners.

Resorcin has been very efficient in 30 to 40 grain doses, for Intermittent and Puerperal fevers. A 5 per cent. solution is well used locally in Erysipelas and Anthrax.

ANTISEPTIC OILS.

Oleum Caryophylli, Oil of Cloves,—contains the *Light and Heavy Oils of Cloves*, the latter containing *Eugenol*, and *Caryophyllin*—a camphor, also *Caryophyllic Acid*.

Oleum Gaultheriæ, Oil of Wintergreen,—consists of *Methyl Salicylate*, 90 per cent., and *Gaultherilen*, a hydro-carbon, 10 per cent.

Oleum Thymi, Oil of Thyme,—contains *Thymol* or *Thymic Acid*, which is a crystalline body homologous with Phenol,—also a hydro-carbon which is resolvable into *Cymene* and *Thymene*.

Oleum Cajuputi, Oil of Cajuput,—contains *Cajuputol* or the *Bihydrate of Cajuputene*, $\frac{2}{3}$; the other $\frac{1}{3}$ being another oil.

Oleum Eucalypti, Oil of Eucalyptus,—contains a volatile oil which consists of *Eucalyptol*, an oxygenated oil, and two other products named *Turpene* and *Cymol*.

Therapeutics. These oils are not much used in medicine. *The Oil of Cloves* is often employed in domestic practice, as a local anæsthetic in toothache and superficial neuralgia. Dissolved in alcohol any of these oils will promptly correct flatulence, if administered internally, in small doses. *Thymol* is a costly but agreeable antiseptic in diphtheria and ulcerated conditions of the mouth and throat. It has also been used in diabetes, vesical catarrh, and phthisis. *Eucalyptol* is a valuable remedy in drop-doses for chronic catarrhs, especially catarrh of the bladder.

EMETICS.

LOCAL EMETICS.

Cupri Sulphas, Sulphate of Copper,—gr. vj, in water, every 15 minutes until emesis occurs; gr. xij may be given at one time in narcotic poisoning. Is promptly efficient. (*See page 55.*)

Zinci Sulphas, Sulphate of Zinc,—gr. vj or viij, in water, every 15 minutes until emesis. Is less irritant than the copper salt. (*See pages 57, 58.*)

Hydrargyri Subsulphas Flavus, Yellow Subsulphate of Mercury, Turpeth Mineral, gr. iij–v, in powder, with Sugar of Milk. The best emetic in croup, being tasteless. (*See page 43 et seq.*)

Alumen, Alum,—a teaspoonful in honey, every half hour. Is safe and efficient, but slow. (*See pages 59, 60.*)

Sinapis Alba, vel Nigra, White or Black Mustard,—as emetic, a teaspoonful or more, in water. Is stimulant to the heart and circulation, also a condiment and carminative in small doses. (*See* page 137.)

Scilla, Squill,—the bulb of *Urginea Scilla*. Not used alone, but in the Compound Syrup of Squill. (*See* page 134.)

SYSTEMIC EMETICS.

Apomorphina, Apomorphine,—an alkaloid derivative from Morphine by the action of strong acids or zinc chloride. Emetic dose by stomach, gr. $\frac{1}{8}$ – $\frac{1}{6}$; hypodermically, gr. $\frac{1}{16}$, of a fresh solution. It is very depressant to the heart, and has caused death by cardiac failure. Is the best emetic when swallowing is difficult, but useless in narcotic poisoning after narcosis has blunted the vagus centre. Has convulsant action on animals, and some expectorant power. (*See* page 96.)

Apomorphinæ Hydrochloras, gr. $\frac{1}{20}$ – $\frac{1}{12}$ hypodermically.

Ipecacuanha, Ipecac,—the root of *Cephaelis Ipecacuanha*,—contains an alkaloid *Emetine*, the active principle and a powerful poison, with *Ipecacuanhic Acid*, a glucoside. Is nauseant, emetic, expectorant, cholagogue, diaphoretic, hemostatic, sternutatory and counter-irritant. As an *Emetic* it is not depressant, but slow of action; gr. iv of the powder, in warm water, every $\frac{1}{4}$ of an hour until emesis. In small doses (m_j of the Wine) it is sedative to the pneumogastric, and will often relieve *Nervous Vomiting* promptly. Large doses (gr. xx every four hours) are used in *Epidemic Dysentery* with great success. It is also well used in *Night Cough*, *Acute Catarrhs*, *Whooping-Cough*, *Hay Fever*, *Asthma*, as an internal remedy against *Hemorrhages*, and a domestic remedy for *Spasmodic Croup*. *Emetine* causes death in animals, by paralysis of the muscles of respiration; the autopsies showing evidences also of gastro-intestinal irritation and hyperæmia of the lungs, with hepatic patches.

Vinum Ipecacuanhæ, m_j–3j. *Syrupus Ipecacuanhæ*, 3j–3ss.

Extractum Ipecacuanhæ Fluidum, m_j–v;—as an emetic, m_x–xx.

Tinctura Ipecacuanhæ et Opii, m_v–xv. Deodorized Tincture of Opium 85 parts, Ext. Ipecac. Fl. 10, Alcohol 5. (*See* page 96.)

Pulvis Ipecac. et Opii, Dover's Powder, gr. ij–xv. Ipecac. 10, Opium 10, Saccharum Lactis 80, well triturated together. (*See* page 96.)

Trochisci Ipecacuanhæ. Trochisci Morphinæ et Ipecacuanhæ.

Antimonii et Potassii Tartras, Tartar Emetic. (*See* page 38.) Is too depressant to be used as an emetic.

CATHARTICS.

LAXATIVES.

Sulphur, Washed Sulphur (S. Lotum), \mathfrak{z} j- \mathfrak{z} ij. (*See* page 39.)

Manna,—the concrete exudation of *Fraxinus ornus*, \mathfrak{z} j- \mathfrak{z} ij. Contains *Mannite*, a sugar; also a *Resin*, probably the laxative principle.

Tamarindus, Tamarind, the preserved pulp of the fruit of *Tamarindus Indica*. Used in *Confectio Sennæ*.

Oleum Ricini, Castor Oil,—a fixed oil expressed from the seeds of *Ricinus Communis*, \mathfrak{z} j- \mathfrak{z} j. The purer it is the less purgative. Contains *Palmitic* and *Ricinoleic acids*, and a drastic principle.

Magnesii Carbonas, \mathfrak{z} j- \mathfrak{z} j. A mild laxative and antacid, but long used it may form intestinal concretions in the bowel.

Mistura Magnesiæ et Asafetidæ, Dewees' Carminative, for flatulent colic and diarrhœa of infants,—dose, gr. xx- \mathfrak{z} iv, as per age.
Has Mag. Carb. 5, Tinct. Asaf. 7, Tinct. Opii 1, Sugar 10, Water 77.

SALINE PURGATIVES.

Magnesii Sulphas, Epsom Salt, \mathfrak{z} j- \mathfrak{z} j. Very soluble in water.

Magnesii Citras Granulatus, Granulated Citrate of Magnesium,— \mathfrak{z} ss- \mathfrak{z} j, in water, drank during effervescence.

Sodii Phosphas, \mathfrak{z} j- \mathfrak{z} ij. (*See* page 23.)

Sodii Sulphas, Glauber's Salt,—purgative dose \mathfrak{z} ss- \mathfrak{z} j.

Potassii et Sodii Tartras, Rochelle Salt, gr. x- \mathfrak{z} ss. (*See* page 33.)

Pulvis Effervescens Compositus, Seidlitz Powder. (*See* page 35.)

MERCURIAL PURGATIVES.

Hydrargyri Chloridum Mite, Calomel, gr. j-gr. x. (*See* page 44.)

Hydrargyrum cum Creta, Gray Powder, gr. ss-gr. iv. (*See* pp. 42, 44.)

TONIC-ASTRINGENT AND RESIN-BEARING PURGATIVES.

Senna, the leaflets of *Cassia acutifolia* and *Cassia elongata*. Contains *Sennacrol*, *Sennapicrin*, bitter principles, *Catharto-mannite*, a sugar; *Cathartic Acid* and a peculiar colloid body.

Extractum Sennæ Fluidum, \mathfrak{z} ss.

Syrîpus Sennæ, \mathfrak{z} j- \mathfrak{z} j.

Confectio Sennæ, Tamar-Indien, Tropical Fruit-Laxative, \mathfrak{z} j-ij.

Infusum Sennæ Compositum, Black Draught, \mathfrak{z} j-iv. Contains in 100 parts, Senna 6, Manna 12, Magnesii Sulphas 12, Fennel 2.

Rheum, Rhubarb,—the root of *Rheum officinale*. Contains *Phæoretin*, also *Chrysophanic*, *Rheo-tannic* and *Rheumic Acids*.

Extractum Rhei, gr. x-xv.

Extr. Rhei. Fl., 3 ss-ij.

Pilulæ Rhei, i-iiij.

Pilulæ Rhei Compositæ, ij-iv.

Aloë, Aloes,—the inspissated juice of the leaves of *Aloë socotrina*. Contains *Soaloin*, also a Resin and a Volatile Oil. *Aloin* is the principle common to all varieties of the plant.

Aloë Purificata, gr. j-v.

Pilulæ Aloës, pills j-v.

Pilulæ Aloës et Asafetidæ, ij-v.

Tinctura Aloës, 3 ss-3 j.

Tinct. Aloës et Myrrhæ, 3 ss-ij.

Jalapæ, Jalap,—the root of *Exogonium purga*. Contains *Convolvulin* or *Jalapin*, one of two Resins, and the most purgative; besides various secondary products.

Abstractum Jalapæ, gr. j-iiij.

Resina Jalapæ, gr. ij-v.

Pulvis Jalapæ Compositus, gr. x-3 j.

Scammonium, Scammony,—a resinous exudation from the root of *Convolvulus scammonia*. Contains a Resin, etc.

Resina Scammonii, gr. v-x.

Colocynthis, Colocynth,—the fruit of *Citrullus colocynthis*. Contains *Colocynthin* and *Colocynthitine*, the latter being soluble in ether, but not in water, and not purgative.

Extractum Colocynthidis Compositum, gr. v-x.

Pilule Cathartice Compositæ, j-iiij pills. Each has of *Extr. Coloc. Comp.*

gr. $\frac{1}{10}$, Abst. Jalapæ, gr. j, Calomel, gr. j, Gamboge, gr. $\frac{1}{4}$.

Podophyllum, May-apple,—the rhizome and rootlets of *Podophyllum peltatum*. Contains the alkaloid *Berberine*, and two Resins, both purgative. *Podophyllin* is an eclectic name for the Resina.

Abstractum Podophylli, gr. $\frac{1}{8}$ -j.

Resina Podophylli, gr. $\frac{1}{2}$ -j.

Extractum Podophylli, gr. v-x.

Extr. Podophylli Fl., ℥v-xxx.

Leptandra, Culver's Root,—the rhizome and rootlets of *Leptandra Virginica*. Contains a Resin, and a crystalline principle. *Leptandrin* of the shops is an impure resin.

Extractum Leptandræ Fluidum, ℥xx-3 j.

Iris, Blue Flag,—the rhizome and rootlets of *Iris versicolor*. The *Iridin* of the shops is an impure oleo-resin.

Extractum Iridis Fluidum, ℥xx-3 j.

Extractum Iridis, gr. ij-v.

**Iridin*, gr. j-iiij.

Euonymus, Wahoo,—the bark of *Euonymus atropurpureus*. Contains *Euonymin*, a bitter principle, also Resins, an Oil, etc.

Extractum Euonymi, gr. j–v.

HYDRAGOGUE CATHARTICS.

Oleum Tiglii, Croton Oil,—a fixed oil expressed from the seeds of *Croton tiglium*. Contains several fatty and volatile acids, one of which is called *Tiglinic Acid*, another *Crotonic Acid*.

Oleum Tiglii, gtt. $\frac{1}{3}$ –gtt. ij, in pill of bread-crumbs.

Cambogia, Gamboge,—a gum-resin from *Garcinia Hanburii*.

Pilule Cathartice Compositæ. (See page 131.)

Elaterinum, Elaterin,—a neutral principle from *Elaterium*, which is a substance deposited by the juice of the fruit of *Ecballium elaterinum*. Its dose is gr. $\frac{1}{16}$ in pill or trituration. *Trituratio Elaterini*, gr. ss–gr. j.

Actions of the various Cathartics. *The Laxatives* simply relax and unload the intestinal canal, without causing active purgation, or increase of the intestinal secretions. *Saline Purgatives* produce watery stools, by increasing secretion and stimulating peristalsis. *Mercurial Purgatives* are now believed not to affect the secretion of bile, but they markedly stimulate the excrementitious glands situated in the lower part of the ileum. *The Tonic-astringent and Resin-bearing Purgatives* increase the secretions of the glandular appendages of the intestinal canal, especially the bile; and stimulate the muscular layer of the bowel. *Hydragogue Cathartics* also produce increased secretion, and violent peristalsis; but also cause a profuse outward osmosis of fluid from the vessels, resulting in large watery stools; and in overdoses may act as irritant poisons.

Therapeutics. Cathartics are indicated for the purposes of—*unloading the bowels* of fecal matter or offending materials,—*depletion* of the vascular system in many diseases,—*promotion of absorption* in general dropsy, ascites, etc.—*revulsion* in inflammation of the brain, etc.,—*elimination* of the products of the retrograde metamorphosis,—and *excitation* of the pelvic circulation. For the last purpose Aloë is the only agent used. *Caster Oil* is much used, and abused, especially in the puerperal state, where it is very apt to produce hemorrhoids. The leaves of the plant applied to the breasts, as a poultice, are said to promote the secretion of milk. *Croton Oil*, though a powerfully drastic agent, is one of the most manageable and easily administered purgatives, by reason of the smallness of the dose required.

ANTHELMINTICS.

Santonica, Levant Wormseed,—the unexpanded flower-heads of *Artemisia maritima*. Contains *Santonin*, a crystalline neutral principle.

Santoninum, Santonin—Dose, gr. $\frac{1}{4}$ –v, as per age, with Calomel.

Trochisci Sodii Santoninatis. Each troche contains one grain of the Santoninate of Sodium. Dose, ij–x, as per age.

Chenopodium, American Wormseed,—the fruit of *C. ambrosioides*.

Oleum Chenopodii, gtt. v–xv, thrice daily, then a cathartic.

Spigelia, Pinkroot,—the root of *Spigelia marilandica*. Contains a Bitter Principle, a Volatile Oil, Tannic and Gallic Acids.

Extractum Spigelia Fluidum,—Dose, \mathfrak{m} x– \mathfrak{z} ij, as per age.

Aspidium, Filix-mas, Male Fern,—the rhizome of *Aspidium filix-mas* and *Aspidium marginale*. Contains *Filicic Acid*, a green, fatty Oil, a Volatile Oil, etc.

Oleoresina Aspidii, \mathfrak{m} v– \mathfrak{z} j. \mathfrak{z} iss caused death.

Granatum, Pomegranate,—the bark of the root of *Punica granatum*. Contains *Punico-tannic Acid* in large quantity, and an active liquid alkaloid, *Pelletierine*.

**Decoctum Granati* (\mathfrak{z} ij ad Oj), \mathfrak{z} ij every hour, up to Oj.

**Pelletierinae Tannas*,—Dose, gr. ss–j, followed by a cathartic.

Brayera, Koussou,—the female inflorescence of *B. anthelmintica*. Contains *Koussin*, a principle, which by itself seems inert.

Extractum Brayeræ Fluidum,— \mathfrak{z} ss in water.

Infusum Brayeræ,—strength, 6 per cent. Dose, \mathfrak{z} iv–viiij or more.

Terebinthina, Turpentine (*see* page 134), \mathfrak{z} ss– \mathfrak{z} ij of the Oil. It should be combined with a purgative, as Castor Oil.

Kamala, Rottlera,—the glands and hairs from the capsules of *Mallotus Philippinensis*. Dose, \mathfrak{z} j– \mathfrak{z} iij.

Pepo, Pumpkin seed,—the seeds of *Cucurbita pepo*. Dose, \mathfrak{z} ij in emulsion, or three half- \mathfrak{z} doses of the Expressed Oil, followed by a cathartic.

Quassia, **Aloe**, **Carbolic Acid**, gr. xx ad Oj aquæ,—as injections against the *Oxyurus Vermicularis* (thread-worm).

The Anthelmintics used against the *Ascaris Lumbricoides* (round-worm) are Santonin, Chenopodium, and Spigelia;—those against the *Oxyurus Vermicularis* (thread-worm) are the same, aided by injections of weak decoctions of Quassia or Aloe, or of Carbolic Acid, gr. xx ad Oj aquæ;—those against the Tæniæ (tape-worms) are Aspidium, Granatum, Brayera, Kamala, Pepo, and Turpentine. Chloroform is sometimes used as a tænia-fuge, and with very great success, in \mathfrak{z} j doses in \mathfrak{z} j of mucilage, for an adult, followed by \mathfrak{z} j of Castor Oil.

DIURETICS.

REFRIGERANT DIURETICS.

Potassium Salts,—especially the Acetate, Bitartrate, Carbonate, Citrate, Chlorate and Nitrate. (See page 33.) They should be largely diluted with water, that fluid of itself having very considerable diuretic power.

Scilla, Squill,—the bulb of *Urginea scilla*, or *Scilla maritima*, a European plant. It contains *Scillitin*, a glucoside, and an acrid non-volatile principle. (See also page 129.) Dose, in powder, gr. j–ijj.

Tinctura Scillæ, ℥v–℥ss. *Acetum Scillæ*, ℥x–℥j.

Syrupus Scillæ, ℥ss–℥j. *Syrupus Scillæ Compositus*, Cox's Hive mixture, ℥v–℥j. Contains Senega and Tartar Emetic, the latter in the proportion of about grain $\frac{3}{4}$ to the ℥.

Digitalis (see page 66). As a diuretic, gr. iij of the powder daily, in divided doses, increased by a grain daily; or the infusion or tincture in corresponding doses. ℥j of the fresh leaves in poultice, over the abdomen, for not over eight hours, will also be sufficient.

Scoparius, Broom,—the tops of *Sarothamnus Scoparius*. Contains *Scoparian*, an inert crystalline body, and *Sparteine*, a liquid alkaloid containing no Oxygen. No official preparations.

**Decoctum Scoparii* (℥j ad Oj), ℥j every 3 hours, until effect occurs.

Spiritus Ætheris Nitrosi, Sweet Spirit of Nitre (see page 89). In a dose of ℥ij–℥ss it is diuretic, but is chiefly employed as an adjuvant to more powerful agents of the same class.

Mistura Glycyrrhizæ Composita has three per cent. of it.

STIMULANT DIURETICS.

Terebinthina, Turpentine,—a concrete oleo-resin from *Pinus australis*, and other species of *Pinus*. Its vapor inhaled produces nasal and bronchial irritation, headache, and perhaps bloody urine and strangury. It is extremely irritant to all the organs of elimination, and to the gastrointestinal tract. Toxic doses produce spinal paralysis, coma and paralysis of respiration. Small doses stimulate the vaso-motor system. It has decided antiseptic power, and is a good counter-irritant.

Oleum Terebinthinæ, ℥v–℥ss. As a diuretic, ℥x–xv, in emulsion, four to six times a day. A little Glycerin and Oil of Gaultheria with each dose will disguise the taste.

Linimentum Terebinthinæ, has Resin Cerate 65, Ol. Terebinth. 35.

Copaiba, Balsam of Copaiba,—the oleo-resin of various species of *Copaifera*. Contains a Volatile Oil and a Resin named *Copaibic Acid*. Differs from the true balsams in that it contains *no Cinnamic Acid*.

Massa Copaibæ, gr. x-3j. *Oleum Copaibæ*, ℥v-3ss.

Cubeba, Cubeb,—the unripe fruit of *Cubeba officinalis*. Contains *Cubebin*, a neutral principle, a Volatile Oil which may be separated into *Cubebene*, a camphor, and *Cubeben*; also a Resin which contains *Cubebic Acid*.

Oleoresina Cubebæ, ℥v-xxx. *Oleum Cubebæ*, ℥v-xx.

Tinctura Cubebæ, 3ss-ij. *Trochisci Cubebæ*, j-ijj.

Extractum Cubebæ Fluidum, ℥v-xxx.

Piper, Black Pepper, the unripe fruit of *Piper nigrum*. Contains *Piperine*, a feeble alkaloid (official), also a Resin and an Essential Oil.

Oleoresina Piperis, ℥¼-j. **Piperina*, gr. j-x.

Capsicum, Cayenne Pepper,—the fruit of *Capsicum fastigiatum*. Contains *Capsicin*, a peculiar liquid principle, also a Volatile Alkaloid.

Oleoresina Capsici, ℥j-v. *Tinctura Capsici*, ℥x-3j.

Extractum Capsici Fl., ℥v-3ss. *Emplastrum Capsici*.

Juniperus, Juniper,—the fruit of *Juniperus communis*. Contains *Juniperin*, a non-crystalline principle, also a Volatile Oil, etc.

Oleum Juniperi, ℥v-xx. *Spiritus Juniperi*, 3j-3j.

Spiritus Juniperi Compositus, Gin, 3ss-3j.

**Oleum Cadinum*, Empyreumatic Oil of Juniper,—locally.

Buchu, the leaves of *Barosma betulina* and other species of *Barosma*. Contains a Volatile Oil, and perhaps *Barosmin*, a bitter principle.

Extractum Buchu Fluidum, ℥x-3j. **Infusum Buchu*, 3ss-ij.

Uva Ursi, Bear-berry,—the leaves of *Arctostaphylos Uva-ursi*. Contain Tannic and Gallic acids, and three principles—*Arbutin*, neutral, bitter, crystalline; *Eriocolin*, bitter, amorphous; and *Ursone*, neutral, tasteless, and crystalline. Dose of the powdered leaves, gr. x-3j.

Extractum Uvæ Ursi Fluidum, ℥x-3j.

Pareira, Pareira Brava,—the root of *Chondodendron tomentosum*. Contains *Buxine*, an alkaloidal principle, also called *Cissampeline*.

Extractum Pareiræ Fluidum, 3ss-3j.

Chimaphila, Pipsissewa,—the leaves of *Chimaphila umbellata*. Contain *Chimaphilin*, a crystalline principle, also *Arbutin*, Tannin, etc.

Extractum Chimaphilæ Fluidum, 3ss-3ij.

Taraxacum, Dandelion,—the root of *Taraxacum Dens-leonis*. Contains

two principles,—*Taraxacin*, bitter, amorphous; and *Taraxacerin*, crystalline. The French call it “Pissenlit.”

Extractum Taraxaci, gr. v-xxx. *Extr. Taraxaci Fl.*, ℥j-℥j.

Matico, the leaves of *Artanthe elongata*. Contain a Volatile Oil and a Resin, also *Artanthic Acid*.

Extractum Matico Fluidum, ℥ ss-ij. *Tinctura Matico*, ℥ ss-ij.

Physiological Actions of the Diuretics. *The Refrigerant Diuretics* modify rather than increase the urine, and exercise a sedative action upon the heart and circulation. Used to excess they depress the heart and impoverish the blood. *Potassium Chlorate* is a decided renal irritant. The *Stimulant Diuretics* are largely eliminated by the kidneys, acting on the genito-urinary mucous tract. In large doses they irritate these parts, some producing violent symptoms, as strangury, bloody urine, etc.

Therapeutics. Diuretics are used to maintain the action of the kidneys, to evacuate accumulations of fluid, and to alter morbid states of the urine. Many agents of this class have special therapeutic uses, of which only a few can be mentioned here. In—

Gonorrhœa,—Cubeb and Copaiba are universally employed.

Catarrh of the bladder, bronchi, etc.,—Buchu, Cubeb, etc.

Turpentine is used with great benefit in many diseases, as—

Adynamic Fevers.

Chronic Catarrhs.

Passive Hemorrhages.

Typhoid Pneumonia.

Tympanitis.

Muscular Rheumatism (locally).

EMMENAGOGUES.

Sabina, Savine,—the tops of *Juniperus Sabina*. Contain an Essential Oil which is isomeric with the Oil of Turpentine.

Extractum Sabinæ Fluidum, ℥v-xv. *Oleum Sabinæ*, ℥j-v.

Ceratum Sabinæ,—has of the fluid extract 25 per cent.

Cantharis, Cantharides, Spanish Flies,—the insect *Cantharis vesicatoria*.

Tinctura Cantharidis, ℥ij-xx. *Linimentum Cantharidis*.

Ceratum Cantharidis.

Ceratum Extracti Cantharidis.

Charta Cantharidis.

Collodium cum Cantharide.

The Cerates, Charta, Linimentum and Collodium are employed locally as counter-irritants and vesicants.

Aloë, Aloes (*see* page 131),—is a purgative emmenagogue.

Ferrum, Iron (*see* page 23 *et seq.*),—is used as a tonic emmenagogue.

Ruta, Rue,—leaves of *Ruta graveolens*. *Oleum Ruta*, m℥j–v.

***Polygonum Hydropiperoides**, Water-pepper. *Fluid Extr.*, ℥x–ʒj.

***Petroselinum**, Parsley,—contains a liquid principle, named *Apiol*, which is used in France as a remedy for intermittents and the amenorrhœa of anæmia, in one dose of gr. xv. As sold here it is generally inert as an emmenagogue.

Physiological Actions. *Sabina*, *Ruta* and *Cantharis* are powerful irritants to the gastro-intestinal mucous membrane and to that of the genito-urinary organs. *Sabina* is considered by many authorities as the most powerful and certain emmenagogue in the materia medica. These agents promote the sexual appetite in men, but only in quantity sufficient to cause dangerous symptoms. The same is true of their use as abortifacients, as doses sufficient to procure an abortion are dangerous to life.

RUBEFACIENTS AND EPISPASTICS.

Sinapis, Mustard,—the seeds of *Sinapis alba* and *Sinapis nigra*.

Oleum Sinapis Volatile, ℥⅛–¼. }
Linimentum Sinapis Compositum. } All made from Black Mustard.
Charta Sinapis, Mustard paper. }

Pix Burgundica, Burgundy Pitch,—exudation of *Abies excelsa*.

Pix Canadensis, Hemlock Pitch,—exudation of *Abies Canadensis*.

Emplastrum Picis Burgundicæ, Burgundy Pitch Plaster.

Emplastrum Picis Canadensis, Canadian Pitch Plaster.

Emplastrum Picis cum Cantharide, Pitch Plaster with Cantharides.

Pix Liquida, Tar,—an empyreumatic oleo-resin from the wood of *Pinus palustris* and other species of *Pinus*. Yields *Pyroligneous Acid*, *Pyrocatechin*, and *Oil of Tar*.

Oleum Picis Liquidæ, Oil of Tar. *Syrupus Picis Liquidæ*, ʒij–iv.

Camphora, Camphor (see page 74).

Linimentum Camphoræ, made with Cotton-seed oil 80 per cent.

Linimentum Saponis, Soap-liniment. Soap 10, Camphor 5, Oil Rose mary 1, Alcohol 70, Water q. s. ad 100 parts.

Terebinthina, Turpentine (see page 134). *Linimentum Terebinthinæ*.

Rubefacient Principle of White Mustard is the Sulpho-cyanate of Acrinyl, produced in the presence of water by a reaction between Sinalbin and the ferment Myrosin.

Composition of the Mustards.

SINAPIS ALBA contains—	{	<i>Sinalbin</i> .	} <i>Sulpho-cyanate of Acrinyl</i> .
		<i>Myrosin</i> , a ferment.	
		<i>Sinapine</i> , an alkaloid.	
		A bland, fixed Oil.	
		<i>Erucic or Brassic Acid</i> .	

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SINAPIS NIGRA contains—	{	<i>Sinigrin</i> (Potass. myronate).	} <i>Allyl Sulpho-cyanide</i> , the Volatile Oil of Mustard.
		<i>Myrosin</i> , a ferment.	
		<i>Sinapine</i> , an alkaloid.	
		A bland, fixed <i>Oil</i> .	
	{	<i>Erucic or Brassic Acid</i> .	

E pispastics (Vesicants),—*Cantharis* in some form is the agent in general use for blistering. (See page 136.) Other efficient epispastics are—

Mezereon.	Glacial Acetic Acid.
Euphorbium.	Volatile Oil of Mustard.
Confined Vapor of Ammonia.	

MEMORANDA ON NEW REMEDIES,

not mentioned in the preceding pages.

Apocynum, Canadian Hemp (official),—the root of *Apocynum cannabinum*. Is a valuable diuretic in doses of gr. xv; in larger doses it is a hydragogue cathartic and an emetic. It has been used with benefit in anasarca and ascites. The active principle, *Apocynin*, is a good expectorant in $\frac{1}{4}$ to $\frac{1}{2}$ grain doses.

Baptisia, Wild Indigo,—is the root-bark of *Baptisia tinctoria*, an indigenous plant. It is emeto-cathartic and cholagogue, and has decided antiseptic power. It is a useful application to fetid or gangrenous sores, in decoction or cataplasm; and internally in amenorrhœa and low, typhoid conditions. In common continued fever, or in the first stage of typhoid, it will be found of great service in drop doses of a fresh tincture every hour. Dose of fluid extract, ℥ij-xx.

Berberis, Barberry,—is the root of *B. aquifolium*, or Oregon grape, and of several species of the same order. Its value is due to its alkaloid, *Berberine*, which occurs also in several other plants. It is a tonic and stomachic in small doses; in larger it is cathartic, and a gastro-intestinal irritant. It is recommended as an alterative and tonic in syphilis and squamous skin affections, also as an antiperiodic in the malarial fevers. The Muriate of Berberine makes a good antiseptic and astringent injection in gonorrhœa.

Boldo,—the leaves and stems of *Peumus boldo*, a Chilian shrub. It is chiefly used as a substitute for quinine, and as a tonic for cases of chronic hepatic torpor. In S. America it is used for gonorrhœa and chronic cystitis. Dose of tincture ($\frac{1}{8}$) ℥x-xx.

Cannabin Tannate, from *Cannabis Indica*,—is recommended as a powerful hypnotic, not dangerous, and neither disturbing the secretions nor leaving unpleasant after-effects if used in proper dose, gr. v–x in pill. It has been particularly well employed in acute mania.

Casca, Ordeal Bark,—is the bark of *Erythrophloeum Guinense*, an African tree, used by the negroes as an ordeal in trials for witchcraft. It causes, when used in quantity, severe cephalalgia, nausea and vomiting, narcosis and death. It is used in Africa as a remedy for intermittent fever, dysentery and colic; and in England it is considered to resemble *Digitalis* in action and uses. Dose of tincture (℥ij ad Oj) ℥x, or of an aqueous extract, gr. j.

Cascara Amarga, Honduras Bark,—is the bark of a Mexican tree used as an alterative in syphilis and various skin affections. The use of tobacco and alcohol is said to counteract its usefulness. Dose of the fluid extract, ℥ss–j.

Cascara Sagrada, Sacred Bark,—the bark of *Rhamnus Purshiana*, or Californian buck-thorn. It is an efficient cathartic, producing large, soft and painless evacuations, and is highly recommended for habitual constipation, given in doses gradually diminishing from ℥ss–℥j of the fluid extract.

Caulophyllum, Blue Cohosh (official),—is the rhizome and rootlets of *C. thalictroides*, an indigenous plant, known to the Indians as “squaw-root.” It is said to produce intermittent contractions of the gravid uterus, and to have diuretic, emmenagogue and anti-spasmodic powers. It is highly recommended in rheumatism of the hands and fingers, spasmodic dysmenorrhœa, and pain about the uterine region. Dose, gr. v–xx. *Caulophyllin* is an impure resin.

Cereus, *Cactus Grandiflorus*,—is highly recommended in functional disorders of the heart, and in cardiac dyspnoea. Dose of fluid extract, gtt. x–xx.

Chaulmoogra Oil, from seeds of *Gynocardia odorata*,—is credited with a few cures of leprosy, and is recommended as an external application in scaly eczema, psoriasis, syphilitic skin diseases, chronic rheumatism, rheumatic arthritis and tabes mesenterica. Dose, gtt. v–x, in capsules, or *Gynocardic Acid*, which is less nauseous, in doses of gr. ss–iij.

Chinolina, Chinoline,—is an alkaloidal derivative of Quinine, also found as a constituent of coal-tar, and artificially prepared by heating anilin or nitro-benzol with glycerin in the presence of a dehydrating agent. It is

a powerful antiseptic and antipyretic; more so than any other substance yet discovered in the search for artificial quinine. It is used as an antipyretic in pneumonia, typhoid and other fevers, and locally in diphtheria. The tartrate is best for internal use. Dose, gr. v-xx.

Chrysarobinum, Chrysarobin (official),—is a mixture of proximate principles extracted from goa-powder, a substance found in cavities of decay in the trunk of Andira Araroba, a Brazilian tree. It is often improperly named “Chrysophanic Acid,” and, used locally, it produces diffuse dermatitis, often followed by follicular and furuncular inflammation. It is a useful application in psoriasis and vegetable parasitic diseases, but should not be used over a large surface at one time. The official ointment contains 10 per cent. of the drug.

Convallaria Majalis, Lily of the Valley,—is a diuretic and a cathartic, and has powers over the heart's action closely resembling those of Digitalis, while free from the apparently cumulative action of the latter drug. It may be used to deepen and strengthen the cardiac contractions, to slow and ease the respiration in dyspnoea, whether cardiac or emphysematous, as a diuretic, especially in cardiac dropsy, and to lower reflex action. Dose, of fluid extract, ℥xv-xx every three or four hours.

Coto Bark,—is the bark of an unknown Bolivian tree, and contains an acrid, bitter principle, named *Cotoin*. It is decidedly irritant to the skin and mucous membranes, but is highly recommended in most forms of diarrhoea, especially that of phthisis, cholera, and typhoid fever. The tincture, in small doses (℥j-v), is used in diarrhoea of children. Paracoto Bark contains *Paracotoin*, and has similar properties. Dose, of fluid extract, ℥j-x or xv,—of Cotoin, gr. ½-ij, of Paracotoin, gr. iv-v.

Damiana, *Turnera aphrodisiaca*,—is the popular aphrodisiac now with the charlatans who advertise “manhood restorers.” It is probably a stimulant diuretic, a bitter tonic, and, in sufficient doses, a purgative. Reports vary much as to its aphrodisiac powers. Dose, of fluid extract, ʒj-ij, up to ʒj daily. The leaves of the plant are used medicinally.

Fuchsine, Magenta,—is an aniline dye occurring in brilliant crystals, and is said to have a remarkable influence in albuminuria with cedema, diminishing the quantity of albumen in all cases, and arresting it entirely in many. Dose, gr. j-ij thrice daily, in pill.

Fucus Vesiculosus, Bladder-wrack,—is a well-known sea-weed, formerly official in the Irish Pharmacopœia, and employed as an alterative and tonic in goitre, psoriasis, glandular enlargements, etc. It produces the absorption of adipose tissue, an extract being largely sold as a remedy for obesity, under the name of “Anti-fat.”

Gurjun Balsam, Wood Oil,—is an oleo-resin obtained from incisions in trees of the genus *Dipterocarpus*. Its properties are similar to those of *Copaiba*, but it is less diuretic and less disagreeable. It has been well used in leprosy. Dose, $\mathfrak{m}\text{x}-\mathfrak{z}\text{ij}$ in emulsion or capsules.

Hoang-nan, *Strychnos Gaultheriana*,—in common with the other members of the *Strychnos* family, is a tetanizing agent. It is recommended in leprosy, syphilis, scrofula, varicose ulcers, eczema, and several skin diseases, and may be given in pill. Dose, gr. $\frac{1}{4}$ —gr. ss.

Hydrangea, *Hydrangea Arborescens*,—the root of this plant has long been used by the Cherokee Indians in calculous affections, and is of decided utility in these disorders, promoting the removal of gravel, relieving pain, etc. Dose, $\mathfrak{z}\text{ss}-\text{ij}$, best in fluid extract, or in decoction, $\mathfrak{z}\text{j}-\text{ij}$.

Jeriquity, seeds of *Abrus Precatorius*,—made into a lotion by macerating 155 grains of them in powder in 17 fluid ounces of cold water, and filtering; rapidly produces a purulent or croupous conjunctivitis in severity proportionate to the number of applications, which, on subsiding, is found to have destroyed old granulations, and other formations, as pannus, corneal ulcers, etc. The seeds are very poisonous, and their application to the eye is a dangerous procedure, the resulting inflammation being often uncontrollable.

Kairine, Hydrochlorate of Oxy-chinolin-ethyl,—an artificial alkaloid, belonging to the phenol group, and a powerful antiseptic in 8-grain doses, every hour. It stains the urine a deep green color, and has not proven toxic, though 220 doses have been given in one case.

Kava-Kava, root of *Piper methysticum*,—is intoxicant, diuretic and motor-depressant. A moderate dose is tonic and stimulant. It is highly recommended in gout, gonorrhœa, chronic gleet and obstinate cystitis. Dose, of root or fluid extract, $\mathfrak{z}\text{ss}-\text{j}$.

Lippia Mexicana,—is recommended as a sedative expectorant in various bronchial affections, especially in coughs due to catarrhal inflammation of the respiratory passages.

Manaca, *Franciscea uniflora*,—is advertised as a purgative, diuretic, emmenagogue and anti-syphilitic, but especially as a remedy for acute and chronic rheumatism. Dose of the fluid extract, $\mathfrak{m}\text{v}-\mathfrak{z}\text{j}$, several times a day.

Mango, Bark of *Mangifera Indica*,—is supposed to act as an alterative to mucous membranes, and has been used in nasal catarrh, endometritis, vaginal leucorrhœa, diarrhœa and dysentery. It is said to check profuse

menstruation, and also the hemorrhage following on abortion. Dose, of the fluid extract, \mathfrak{m}_x - $\mathfrak{z}\mathfrak{j}$.

Menthol, Peppermint Camphor,—is a stearoptene deposited by Oil of Peppermint on exposure to cold. It is antiseptic and locally anæsthetic, but not corrosive, and acts as a vascular stimulant when applied to the surface. It has been chiefly used as a local application in various neuralgiæ and in odontalgia, an alcoholic solution ($\mathfrak{z}\mathfrak{j}$ to $\mathfrak{z}\mathfrak{ss}$) being painted over the part, or applied on cotton to the cavity of a carious tooth.

Myrtus Chekan, a Chilian plant;—is recommended as an expectorant in bronchitis, winter cough, etc., also in chronic cystitis and catarrhal affections of other mucous membranes. Dose, of the fluid extract, $\mathfrak{z}\mathfrak{j}$ - $\mathfrak{z}\mathfrak{ss}$.

Naphthalin, one of the many products of the distillation of coal tar;—is a white, crystalline body, of high value as an antiseptic and a stimulant expectorant. Dose, gr. v-xxx, in syrup or emulsion.

Paraldehyd,—is a polymeric form of aldehyd, recently introduced as a hypnotic, resembling Chloral in its action, except that it strengthens and slows the heart instead of weakening it, but in large doses it paralyzes the respiratory centre. It is powerfully diuretic, but not diaphoretic. Dose, \mathfrak{m}_{xx} -xl, in water.

Piscidia Erythrina, Jamaica Dogwood,—has been introduced as a substitute for Opium, being anodyne, hypnotic and narcotic, sialogogue, diaphoretic and mydriatic. It lowers reflex action, and arterial tension after a brief rise, weakens the heart and causes death by asphyxia. It is a good hypnotic and anodyne. Dose, of the fluid extract, $\mathfrak{z}\mathfrak{ss}$ -j, cautiously.

Sarracenia Flava, Trumpet plant, Pitcher plant,—has been well employed in dyspepsia, various diarrhœas, and chronic nasal catarrh, also as an injection in gonorrhœa and leucorrhœa. Dose, of the fluid extract, \mathfrak{m}_x - $\mathfrak{z}\mathfrak{j}$.

Stigmata Maydis, Corn Silk,—is diuretic, demulcent and antiseptic, and is highly recommended in cystitis, as a mild diuretic in cardiac and renal affections, and as a corrective of nocturnal incontinence of urine. Dose, of the fluid extract, $\mathfrak{z}\mathfrak{j}$ -ij.

Tonga,—is a preparation imported from Figi, consisting of root-fibres, leaves and inner bark of some plants, believed to be *Rhaphidophora vitiensis*, and *Premna tatiensis*. From this a liquid is prepared which has proved very efficient in $\mathfrak{z}\mathfrak{j}$ doses ter die, for neuralgia.

Verbascum Thapsus, Mullein Plant,—is being highly praised as a substitute for Cod-liver Oil in phthisis and other wasting diseases. It is used in infusion, $\mathfrak{z}\mathfrak{iv}$ of the fresh leaves in a pint of fresh milk, thrice daily.

Viburnum, the bark of *V. Prunifolium*, Sloe or Black Haw,—is said to be a sedative and tonic to the uterine and ovarian nerve-centres. It is used as an anti-abortive, and in uterine congestion, ovarian irritation, irregular menstruation with dysmenorrhœa and menorrhagia. The fluid extract is official, and may be given in doses of ℥xx-℥j, with aromatics, nervous sedatives, Cannabis indica or Morphine. *Viburnum Opulus* is highly valued by those who have used it, as a remedy for uterine and other abdominal pains.

Yerba Reuma, *Frankenia grandiflora*,—this Californian plant is recommended as highly efficient in diseases of the mucous membranes, especially in chronic nasal catarrh, gonorrhœa, leucorrhœa and dysentery. It is used, locally, ℥ij of the fluid extract to ℥iv of water. Dose, internally, ℥x-xx.

Yerba Santa, *Eriodcyction glutinosum*,—another Californian production; is expectorant, and usefully employed in bronchial and laryngeal disorders. It is said to cover the taste of Quinine in a remarkable manner. Dose, of the fluid extract, ℥ss-j.

PRESCRIPTION WRITING.

Extemporaneous Prescriptions are formulæ written by the physician on the instant (*ex tempore*), to meet the requirements of individual cases.

A prescription has four component parts, viz.—the

SUPERSSCRIPTION,—which consists of the name of the party for whom it is designed, the date, and the sign **R**—signifying “Take,” or “Take thou.”

INSCRIPTION,—the body of the prescription, consisting of one or more of the following subdivisions, viz.—the

Basis, or chief ingredient.

Adjuvant, to assist the action of the basis.

Corrective, to correct some injurious quality of the other ingredients.

Vehicle or Excipient, to give it form.

SUBSCRIPTION,—the directions for the compounder, usually expressed in contracted Latin.

SIGNATURE,—the instructions for the administration of the medicine, expressed in English or Latin, and followed by the signature of the prescriber.

A prescription may, however, contain the basis alone, or the basis with the adjuvant, or the basis with a simple vehicle or diluent. A single ingredient may serve a double or a treble office, as the Aromatic Syrup of

Rhubarb with Quinine, in which the syrup serves as an adjuvant to increase the action of the quinine, as an excipient to cover the taste, and as a vehicle to facilitate the administration of the dose directed. Again, the basis may need no aid in doing its work, and may require no corrective of its action, nor any special vehicle. On the other hand, there is no limit to the number of ingredients which may be used, provided that the prescriber has a clear idea of something to be accomplished by each one, and also provided that there is no chemical or medicinal incompatibility between them. Formerly prescriptions were very complex, and contained a great many curious and incongruous ingredients. As Dr. Piffard well says, "the tendency of the present age is towards mono- rather than poly-pharmacy, and prescriptions with the orthodox *adjuvans* and *corrigens* are less frequently seen than formerly." There is danger, however, in carrying this simplicity too far, for there is no doubt but that proper combinations of medicines will often produce effects for the patient's good, which could not be obtained from the use of any one remedy.

Procedure in Writing a Prescription. The first step is to write the name of the patient, the date, and the sign R. Then the title of each ingredient should be written in Latin and in the genitive case, except when only a certain number of an ingredient is to be used, the ingredient should be in the accusative case, as for example, "*Vitellum unum*,—one Yolk-of-egg." Next the quantity of each ingredient sufficient for one dose should be mentally determined, and multiplied by the number of doses which the mixture, etc., is to contain, and the result set down in signs and Roman numerals opposite the designation of each article. Directions to the pharmacist and for the patient being added, and the prescriber's name or initials being affixed, the prescription is completed. Frequently, the ingredients and their quantities for but one dose, in pill, powder, suppository, etc., are named, with instructions to make a certain number after the formula prescribed. When an unusually large dose of any poisonous drug is prescribed, it is customary to underline the quantity, so as to call the attention of the compounder to the fact that the large dose is ordered intentionally.

An Example will perhaps make the foregoing more comprehensible, and at the same time serve to indicate the style of writing usually employed. The following formula is that ordered in the U. S. Pharmacopœia for the preparation known as "*Black Draught*," but officially styled the *Compound Infusion of Senna*; approximate weights and measures being substituted for the pharmacopœial parts by weight.

<i>For Mrs. Gray.</i>		<i>July 7th, 1886.</i>	} SUPERScription.
<i>Recipe, Take,—</i>			
(Basis.)	{ <i>Sennæ, semiunciam,</i> Of Senna, half an ounce, <i>Magnesii Sulphatis,</i> Of Magnesium Sulphate,	} INSCRIPTION.	
(Adjuvant.)	{ <i>Mannæ, ana unciam unam,</i> Manna, of each an ounce,		
(Corrective.)	{ <i>Feniculi, drachmam unam,</i> Of Fennel, one drachm,		
(Vehicle.)	{ <i>Aquæ Bullientis, fluiduncias octo,</i> Of Boiling Water, eight fluid-ounces.		
<i>Macera per horam in vase clauso, deinde cola.</i>			} SUBSCRIPTION.
<i>Macerate for an hour in a closed vessel, then strain.</i>			
<i>Signa,—Mark or Write, thus—A wineglassful every</i>			} SIGNATURE.
<i>four hours 'till it operates.</i>			
<i>T. F. Wood, M. D.</i>			

Abbreviated in the style usual among physicians, the above prescription would read as follows, viz.—

<i>For Mrs. Gray.</i>	<i>July 7th, 1886.</i>
<i>R. Sennæ.....</i>	<i>℥ss.</i>
<i>Magnesii Sulph.</i>	
<i>Mannæ.....</i>	<i>aa ʒj.</i>
<i>Feniculi.....</i>	<i>ʒj.</i>
<i>Aquæ Bull.....</i>	<i>fʒviij.</i>
<i>Mac. per hor. in vase clauso, deinde cola.</i>	
<i>Sig.—A wineglassful every four hours, 'till it operates.</i>	
<i>Wood.</i>	

As the result of the above is nearly identical with the official preparation, we might write the same prescription more simply, as follows,—

R. Infusi Sennæ Compos., ʒ viij.

with the proper superscription and signature; this being the manner of prescribing the official preparations.

It will be noticed that in the above analysis the term “basis” covers two ingredients; but it is obvious that either of them might be considered the principal agent, and the other one classed as an adjuvant.

“These four parts of a formula are intended to accomplish the object of Asclepiades, *curare cito, tute et jucunde*; in other words, to enable the basis to cure quickly, safely and pleasantly.” (Pareira.)

Another Example will illustrate the mental operations which should always be followed by a prescriber; for no matter how good a memory he may have, he will surely make a grievous mistake some day if he follow the practice of writing prescriptions from memory. Furthermore, the un-

scientific character of the latter habit will, when appreciated, prevent any educated physician from indulging in it. Every prescription should be written with a definite purpose in view, consequently the mind of the prescriber should weigh each step carefully, and should avoid all slavish subjection to ready-made formulæ.

Suppose, then, that we wish to order for Miss Graham an emulsion of Castor Oil, flavored and sweetened so as to make it less disagreeable to the taste than it naturally is. If the ingredients were simply mixed together, as in the previous example, the result would be an unsightly preparation, consisting of sweetened and flavored water with the oil floating on top. So we require that the process of emulsification be first accomplished, by which the oil is minutely subdivided and suspended in the water, by the aid of the emulsifier, which may be any viscid excipient, as gum, soap, or yolk-of-egg. Taking the last-named for the emulsifying agent, we would begin by writing down in order the following terms, as stated in italics, viz.—

For Miss Graham.

June 10th, 1836.

℞. (Take thou—)

Olei Ricini, (of Oil of Castor),

Vitellum, (Yolk-of-egg),

Tere bene simul; dein adde—(Rub well together; then add—)

Having gone so far, we begin to think of an agreeable vehicle, and choosing from the many Syrups at our disposal that of Ginger, and from the flavored Waters that of Cinnamon, we write further for these as the ingredients to be added, thus—

Syrupi Zingiberis, (of Syrup of Ginger),

Aquæ Cinnamomi, (of Cinnamon-Water).

The ingredients are now all entered upon the prescription, but their respective quantities have not yet been decided on. We proceed, then, by first taking into consideration the total quantity of the medicament required,—which, in this case, as the preparation is intended to purge the patient, need not embrace more than one or two doses. As it is well to provide for a repetition of the dose, in case the medicine should not act sufficiently, we will decide upon two doses in all. Now, the average adult dose of Castor-oil is about a tablespoonful, or half-an-ounce, and as we want two such doses we insert the sign and numeral $f\text{℥}j$, or simply $\text{℥}j$, opposite the title of the oil, which is written in the genitive case. But to emulsify it properly we need about one-half as much of the emulsifying agent, and we may express this by writing for half-an-ounce of yolk-of-egg, or for the yolk of one egg, or for one yolk-of-egg, which weighs about half-an-ounce.

This would be expressed in Latin by either of the following methods, viz.—

Vitelli, semi-unciam, (℥ss). One half-ounce of Yolk-of-egg.

Vitellum ovi unius, (j). The Yolk of one egg.

Vitellum unum, (j). One Yolk-of-egg.

As the word *Vitellus* means Yolk-of-egg, we may omit the word *Ovi*, and accepting the latter as the best style, insert the numeral j opposite the word *Vitellum*, which is properly in the accusative case. The whole quantity so far specified is one ounce and a half, and if we add two and a half ounces of diluent, we shall have a four-ounce mixture, or the full of a regular sized bottle, as found in the shops. There being considerable viscosity already present in the emulsion we do not need much syrup, so we assign to the Syrup of Ginger the odd half-ounce, leaving two ounces of the Water to make up the total bulk of four fluid-ounces.

The prescription now only requires for its completion that the subscription and signature be added. We proceed to admonish the dispenser by telling him to mix the ingredients together, and therefore write the word "*misce*," or the abbreviation "*M*" commonly used therefor; and to further point out the nature of the preparation we add, "*let be made an emulsion*," or in Latin, "*fiat emulsio*,"—the passive verb taking as predicate-nomina-tive the thing into which the making is to be. The final words "*Label*"—or "*Write thus*"—are expressed by the term "*Signa*,"—followed by the directions for the patient or the person who is to administer the medicine, which should be in English, though they may also be written in Latin. Our completed prescription will stand thus,—

<i>For Miss Graham.</i>	<i>June 10th, 1886.</i>
℞. <i>Olei Ricini</i>	℥j.
<i>Vitellum</i>	j.
<i>Tere bene simul, dein adde—</i>	
<i>Syrupi Zingiberis</i>	℥ss.
<i>Aquæ Cinnamomi</i>	℥ij.
<i>M. fiat emulsio.</i>	
<i>Sig.—"One-half at once, to be repeated next day if</i>	
<i>required."</i>	<i>Potter.</i>

The last entry of the inscription might also be written thus,—"*Aquæ Cinnamomi, quantum sufficiat ad ℥iv*," meaning "of Cinnamon-Water as much as may be necessary to [bring the whole quantity to] four ounces,"—usually expressed in contracted style, thus—

Aq. Cinnamomi, q. s. ad ℥iv.

This style is preferred when any of the quantities are approximations, and the final item cannot be exactly stated to secure a certain total. In

the foregoing case, the one yolk-of-egg might measure a little more than the half-ounce assigned to it; but by using the *g. s. ad* style at the end, we make sure of getting a total of exactly four fluid-ounces.

In more complicated prescriptions, the mode of reasoning is precisely the same; practice, care, and knowledge of the whole subject being necessary to the production of those elegant prescriptions which are correctly termed "magistral," as the work of a *magister*, or master of his business.

Metric Prescriptions are written or read with sufficient accuracy, by considering a gramme as equal to 15 Troy grains, and a cubic centimeter (or millileter) as equal to 15 minims or one-fourth of a fluid-drachm. All other terms, units or prefixes, belonging to the metric system, may be wholly ignored by both physician and pharmacist. The decimal point after the gramme or the cubic centimeter should always be replaced by a line, so as to avoid errors, which in many cases might prove serious, from the misplacement of a point, the dropping of an ink-spot, or the intrusion of a fly-speck.

The simplest method of writing a prescription in metric terms, is to first write for one dose of each ingredient in grains and minims, then by substituting the same number of grammes and cubic centimeters (fluid-grammes), we get fifteen doses in metric terms. For example,—

	One Dose.	15 Doses Metric.
Rx. Quinina Sulphatis,.....	gr. j	1
Strychnina Sulphatis,.....	gr. $\frac{1}{8}$ or 0.016,	016
Ext. Glycyrrhiza Fl.,.....	℥iv,	4
Syrupi,.....	℥lx.	60

This gives a two-ounce mixture approximately, of which the dose would be "a teaspoonful thrice daily."

The above rule will answer for all liquids except those which are very heavy (as Syrups and Chloroform), or very light (as Ether). Measures may be entirely discarded and all fluid quantities expressed in grammes. The average drop of water may be taken as equal to 0.05 c.c., the teaspoonful to 5 c.c., the tablespoonful to 20 c.c., the \mathfrak{z} to 30 c.c. (or grammes), and \mathfrak{z} viij to 250 c.c.

Abbreviations are in general use in prescription writing, but should be avoided as much as possible. Their lavish use is a sign of the prescriber's ignorance of Latin, they confound the compounder, enhance the chances for error, and are therefore a frequent source of danger to the patient. In the larger works on pharmacy, very full lists of the commonly used abbreviations are given. The following table gives a few examples of the dangers of carelessness in their employment.

Aconit.—may mean either *Aconitum* or *Aconitina*.

Ammon.—*Ammonia* or *Ammoniacum*.

Ac. Hydroc.—*Acidum Hydrochloricum* or *Acidum Hydrocyanicum*.

Aq. Font.—might easily be read *Aqua Fortis*.

Chlor.—*Chlorum*, *Chloral*, or *Chloroformum*.

Hyd. Chlor.—*Hydrate of Chloral*, *Hydrargyri Chloridum*.

Sulph.—*Sulphur*, *Sulphas*, *Sulphidum*, *Sulphitum*.

Zinc. Phos.—*Zinci Phosphas* or *Zinci Phosphidum*.

Latinizing a prescription correctly requires a very limited knowledge of the Latin language, yet that little is too often absent from the education of would-be doctors of medicine. Within the small space which can be allotted to this portion of the subject in these pages, it is impossible to offer more than a few notes to guide the student at first. For full treatment of the subject the reader is referred to Pareira's Prescription Book, which deals fully with every detail.

Genitive Case-Endings.

NOM.	GEN.	EXCEPTIONS.																								
a	æ	Cataplasma, Enema, Physostigma, Aspidosperma and Gargarysma, all have the genitive in <i>-atis</i> . †Coca is unchanged. Folia is plural, gen. Foliorum.																								
us um os on	i	Rhus, Rhois; Flos, Floris; Bos, Bovis; Limon, Limonis; Erigeron, -ontis. Fructus, Cornus, Quercus, Spiritus, do not change.																								
as	atis	Asclepias, -adis; Mas, Maris.																								
is	idis	Pulvis, -eris; Arsenis, -itis, Phosphis, -itis, Sulphis, -itis, and all salts ending in -is, have genitive in -itis.																								
o	onis	Mucilago, -inis; Ustilago, -inis; Solidago, -inis.																								
l	lis	Fel, Fellis; Mell, Mellis; Sumbul, Sumbuli.																								
en ps rs r x	inis pis rtis ris cis	<p><i>Words which do not change in the Genitive.</i></p> <table><tr><td>*Amyl.</td><td>Cannabis.</td><td>Curare.</td><td>Kino.</td></tr><tr><td>Azedarach.</td><td>Catechu.</td><td>Fructus.</td><td>Matico.</td></tr><tr><td>Berberis.</td><td>†Coca.</td><td>Digitalis.</td><td>Quercus.</td></tr><tr><td>Buchu.</td><td>Cundurango.</td><td>Hydrastis.</td><td>Sassafras.</td></tr><tr><td>Cajuputi.</td><td>Cornus.</td><td>Jaborandi.</td><td>Sago.</td></tr><tr><td></td><td>Sinapis.</td><td>Spiritus.</td><td></td></tr></table>	*Amyl.	Cannabis.	Curare.	Kino.	Azedarach.	Catechu.	Fructus.	Matico.	Berberis.	†Coca.	Digitalis.	Quercus.	Buchu.	Cundurango.	Hydrastis.	Sassafras.	Cajuputi.	Cornus.	Jaborandi.	Sago.		Sinapis.	Spiritus.	
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Cajuputi.	Cornus.	Jaborandi.	Sago.																							
	Sinapis.	Spiritus.																								

* Amylis, is given.

† Cocæ, is given.

VERBS.

The Verbs used in prescription-writing are nearly all in the imperative mood, giving directions to the compounder, and having their object in the accusative case. Such are—

<i>Addē</i> , add.	<i>Fac</i> , make.	<i>Recipe</i> , take.
<i>Cola</i> , strain.	<i>Filtra</i> , filter.	<i>Signa</i> , write.
<i>Divide</i> , divide.	<i>Macera</i> , macerate.	<i>Solve</i> , dissolve.
<i>Extende</i> , spread.	<i>Misce</i> , mix.	<i>Tere</i> , rub.

A few verbs are found in the subjunctive mood, taking their subject or predicate in the nominative case. The most usual are—

<i>Fiat</i> , let be made.	<i>Bulliat</i> , let boil.
<i>Fiant</i> , let be made.	<i>Capiat</i> , let take.
<i>Coletur</i> , let be strained.	<i>Detur</i> , let be given.
<i>Coloretur</i> , let be colored.	<i>Dividatur</i> , let be divided.
<i>Sumatur</i> , let be taken.	<i>Sit</i> , let it be.

PARTICIPLES.

Participles or Verbal Adjectives, are occasionally used, and should agree with their respective nouns in gender, number and case. Such are the following, viz.—

<i>Dividendus</i> , -a, -um, to be divided.
<i>Sumendus</i> , -a, -um, to be taken.
<i>Adhibendus</i> , -a, -um, to be administered.

PREPOSITIONS.

Those in the first column require the noun following to be in the accusative case,—those in the second column require the ablative case.

<i>Ad</i> , to, up to.	<i>Cum</i> , with.
<i>In</i> , into.	<i>Pro</i> , for.
<i>Supra</i> , upon.	<i>Sine</i> , without.
<i>Ana</i> , of each,—governs the genitive case.	

SUNDRY WORDS AND PHRASES.

<i>Bene</i> , well.	<i>Non</i> , not.	<i>Ad saturandum</i> , to saturation.
<i>Bis</i> , twice.	<i>Numerus</i> , number.	<i>Numero</i> , to the number of.
<i>Dein</i> , thereupon.	<i>Octarius</i> , a pint.	<i>Quantum sufficiat</i> , as much as necessary.
<i>Et</i> , and.	<i>Semel</i> , once.	<i>Pro re natâ</i> , according to need.
<i>Gradatim</i> , gradually.	<i>Simul</i> , together.	<i>In parts æquales</i> , into equal parts.
<i>Guttatim</i> , by drops.	<i>Statim</i> , at once.	<i>Redactus in pulverem</i> , let be pulverized.
<i>In dies</i> , daily.	<i>Ter</i> , thrice.	<i>Secundum artem</i> , according to art.

Principles of Combination include certain maxims which should never be lost sight of. To prescribe as few remedies as possible, and to order no powerful drug without a distinct idea of its office in the prescription, are, perhaps, the chief; to which may be added another, namely—to give powerful agents by themselves when required for impression on the system.

Medicines are combined for several purposes,—(1), to increase, correct, or modify the action of another medicine; (2), to obtain the joint action of two or more diverse remedies; (3), to obtain by chemical reaction a special combination, which is either a new remedy, or which acts as a new remedy; (4), to give a suitable form for administration, or for preservation.

Incompatibility may be Chemical, Pharmaceutical or Therapeutical, according as the incompatible combination results in chemical decomposition, physical disassociation, or antagonistic physiological action. The first kind may be intentional, for the purpose of obtaining a new substance as the result of the chemical action;—for example, the prescribing Calomel or Corrosive Sublimate with Limewater, to produce respectively the black and yellow Oxides of Mercury.

The Dangers of Incompatibility may in a great measure be avoided by the use of the utmost simplicity in prescribing. The subject can only be glanced at within these pages, but the following simple rules may help the burdened memory of the student and the practitioner.

(1). Never use more than one remedy at a time, if one will serve the purpose.

(2). Never use *strong Mineral Acids* with other agents, unless you know exactly what reaction will ensue. They decompose salts of the weaker acids, and form ethers when combined with alcohol. Never combine *free acids* with hydrates or carbonates.

(3). Select the simplest solvent, diluent or excipient you know of, remembering that the solvent power of alcohol and of water for their respective substances decreases in proportion to the quantity of the other added.

(4). Generally do not combine two or more soluble salts; for salts in solution, when brought together, usually exchange their radicles, thereby forming an insoluble compound.

The following more or less insoluble salts will be formed whenever the materials of which they are composed are brought together in solutions; the Hydrates, Carbonates, Phosphates, Borates, Arseniates and Tannates of most earthy and heavy metals and alkaloids, and the metallic Sulphides; the Sulphates of Calcium, of Lead, and of the salts of Mercury; the Chlorides, Iodides, and Bromides of Bismuth, Silver, Lead, and salts of Mercury; the Iodides of Quinine, Morphine and most alkaloids.

(5). Never order a drug in combination with any of its Tests or Antidotes.

(6). Never prescribe a *Glucoside*, (as Santonin, Colocynthin, etc.), in combination with *free acids* or with a substance containing *Emulsin*, as these agents will decompose it.

(7). *Aconite* should be ordered in water alone, *Mercuric Chloride* by itself in water or in simple syrup. The latter drug is incompatible with almost everything, even the Compound Syrup of Sarsaparilla being said to decompose it.

(8). *Iodide of Potassium* decomposes most of the metallic salts, and is one of the drugs which are best administered alone.

(9). *Resinous Tinctures or Fluid Extracts*, (e. g., Tinct. Cannabis Indicæ), when combined with aqueous solutions, should always have Acacia or some other emulsifying agent added, to prevent the separation of the resin, which otherwise will be deposited on the sides of the bottle or will float on top of the mixture.

(10). *Silver Nitrate* and the *Acetate* and *Sub-acetate of Lead*, though incompatible with almost everything, may be combined with *Opium*, the latter forming with Opium a compound, which, though insoluble, is therapeutically active as an astringent and anodyne lotion. *Silver Nitrate* with *Creasote* forms an explosive compound.

(11). *Tannic and Gallic Acids*, and substances containing them (as the Astringent Bitters), precipitate albumen, alkaloids and most soluble metallic salts. They may be prescribed with the proto-salts of Iron, but not with its per-salts. *Calumba* is the best vegetable tonic to use with ferric salts, as it contains neither tannic nor gallic acids. *Tannic Acid* precipitates gelatin.

(12). *Iodine* and the soluble *Iodides* are incompatible with the alkaloids and substances containing them, also with most metallic salts.

(13). *Alkalies* neutralize free acids, and precipitate the alkaloids and the soluble non-alkaline metallic salts. *Oxides of the Alkalies* decompose salts of the metals proper, and salts of the alkaloids, precipitating their bases; but the base may be soluble in an excess of the alkali.

(14). *Poisonous Compounds* may be formed by the admixture of several substances in solution, such as—

Potassium Iodide with Potassium Chlorate.

Potassium Cyanide or Dilute Hydrocyanic Acid, with Calomel, Bismuth salts, metallic hydrates, carbonates, subnitrates or subchlorides, forming poisonous cyanides.

(15). *Explosive Compounds* result from mixing powerful oxidizing agents with others which are readily oxidizable. The chief members of these two classes are as follows—

<i>Oxidizers.</i>	<i>Oxidizable or Combustible.</i>
Nitric Acid.	Glycerin, Sugar, Alcohols.
Chromic Acid.	Oils and Ethers.
Nitro-hydrochloric Acid.	Sulphur and Sulphides.
Potassium Chlorate.	Dry Organic Substances.
Potassium Permanganate.	Phosphorus.

Instances of Pharmaceutical Incompatibility.

Resinous tinctures or fluid extracts with Aqueous solutions.
 Tincture of Guaiac with Spirit of Nitric Ether.
 Compound Infusion of Gentian with Infusion of Wild Cherry.
 Compound Infusion of Cinchona with Compound Infusion of Gentian.
 Essential oils with Aqueous liquids in quantities exceeding 1 drop to ℥j.
 Fixed oils and Copaiba with Aqueous liquids (except excipients).
 Tinctures made with Alcohol with those made with Diluted Alcohol.
 Alcoholic tinctures and fluid extracts with Aqueous preparations.
 Spirit of Nitric Ether with strong Mucilages.
 Infusions generally with Metallic salts.

PRECIPITANT SOLUTIONS.

The following table shows the most important instances of solutions which mutually precipitate each other, the letter P meaning “forms a precipitate with”—

TABLE OF SOME MUTUALLY PRECIPITANT SOLUTIONS.	Alkaloidal Solutions (generally).	Metallic Solutions (generally).	Lead Solutions.	Silver Solutions.	Calcium Solutions.	Magnesium Solutions.	Albuminous Solutions.	Gelatinous Solutions.
Solutions of Alkalies.....	P	P	P	P	P	P	.....	.....
Tannic Acid.....	P	P	P	P	.....	.....	P	P
Carbonic Acid and Sol. of Carbonates....	P	P	P	P	P	P	.....	.....
Sulphuric Acid and Sol. of Sulphates....	.....	.....	P	P	P	P	.....	.....
Phosph'c Acid and Sol. of Phosphates...	P	P	P	P	P	P	.....	.....
Boric Acid and Solutions of Borates.....	P	P	P	P	.....	.....	.....	.....
Hydrochloric Acid and Sol. of Chlorides.	.....	.....	P	P	.....	.....	.....	.....
Hydrobromic Acid and Sol. of Bromides.	.....	.....	P	P	.....	.....	.....	.....
Hydriodic Acid and Solutions of Iodides.	P	P	P
Solutions of Sulphides.....	P	P	P
Arsenical Solutions.....	P	P	P
Albumen.....	P	P	P

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